# AUDIO VISUAL COMMUNICATION REVIEW

AV


Henry R. Cassirer — Learning To See

Joseph H. Kanner — Future Trends in Television Teaching and Research

Leslie P. Greenhill — Application of Sound Motion Pictures to Research in Clinical Psychology

Departments:

Film

Book Reviews

Research Abstracts

Index, Volume V



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# AUDIO-VISUAL COMMUNICATION REVIEW



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# LEARNING TO SEE

• HENRY R. CASSIRER

*In a thoughtful discussion of the role of visual thinking in education, the author presents some challenging ideas on ways to use pictures and graphics in the classroom. Henry R. Cassirer is head of television for UNESCO and was formerly television news editor of the Columbia Broadcasting System.*

SEEING is said to be believing. Understanding is knowing. Education seeks to convey belief based on knowledge, knowledge which is believable. It is an emotional and intellectual process to form and inform the child. To accomplish this, teaching need be concerned both with the visual and the verbal products of civilization, as subjectmatter and as method.

Without seeking to diminish the value of instruction as a tool in producing useful citizens, the fundamental aim is a sound personality. The key to education is, therefore, communication of guiding principles in personal achievement and social behavior, training in clear thinking, as well as infusion of a sense of values with regard to the cultural and material products of society.

It is these values which serve man in the constant challenge of selection which he faces in a highly developed democratic society. We have today a perplexing number of alternatives in chosing the place to live, the career, the groups and individuals among whom we mix. Among the most troublesome of these alternatives is the manner in which we spend our leisure time amidst the flood of prefabricated entertainment which surrounds and invades our privacy. The issue here is not so much what to choose as what not to choose, where to turn off, to withdraw. Where there is choice, there must be intelligent standards by which to choose.

Leisure is important in our age not only because an ever-increasing portion of our life is set free from the obligations of breadwinning and domestic chores, but because, with specialization of work on the one hand and diffusion of cultural products on the

other, it is in their leisure time alone that most people can share in the richness of our culture.

It has long been the practice of schools to introduce children to good books, good music, and good theater. We have held to the notion that schools must open the gates to these high points of the human mind. The aim here is to inform about the thought of former and contemporary ages, as well as to instill that sense of values and perfection which alone can give us rich enjoyment and may enable us to produce in turn works of permanency and accomplishment.

Yet too often have we found that children, once they leave school, turn their backs upon "the classics" as something to be studied rather than enjoyed, as something dead and stilted rather than full of emotional impact and vivid meaning for young people of today. There exists a dangerous gap between the world of the book, the play, and the chamber orchestra, and that of television, the movies, and the jukebox. Can leaders of young people in and out of school afford to ignore these media?

*The Role of Visual Communication*

The tendency to relegate school learning to the store of dead baggage is reinforced by the importance of visual communication in modern society. School education in the classical tradition is based on the word as the culmination of intellect. Language and the printed word are seen as the tool of communication from man to man and from generation to generation. Verbal abstraction and analysis lead us to the quintessence of knowledge. Even where the picture is integrated into the learning process, it becomes a "visual aid," an aid to the word rather than an expression and means of communication in its own right.

It would seem, however, that the picture is more than mere aid and that knowledge is more than the memorizing and formulation of verbal concepts. The imperfection of language, especially of the printed word, as a means of communication has long been established. Through its very abstraction, the word lends itself to multiple interpretation because its understanding is conditioned by subjective associations. The word symbol which carries with it a fixed connotation tends to crystallize into static notions many of the concepts which can only be understood in dynamic motion.

*A World in Motion*

A form of communication which negates change and motion is bound to come into conflict with our time. What distinguishes our age from all former eras is speed. Man has never moved so fast on land, on water, and least of all in the air. He has never produced as fast. The visible world has never changed as rapidly. Society has never undergone such profound transformations in such a short span of time.

In constant motion ourselves, we have come to recognize the constantly changing state of the world in which we live. The natural sciences recognize that motion is primary and the mere static deception of our inadequate senses which cannot perceive the inner mobility of the atom or the conversion of energy into matter. This recognition has not prevented scientists from seeking with ever greater intensity to discover the universal laws governing this motion, to determine the common fundamentals which find expression in ever-changing manifestations.

Similarly, we now appreciate the lack of permanency or stability in human society. We can understand a social phenomenon only by seeing it as postscript to the past, as one of many factors interacting with others in the present, and as foreword to the future. Yet here, too, do we seek to discover the common principles governing human behavior to reach the rock bottom of fundamentals.

A world in motion requires of man that he be able to seize it rapidly and to symbolize it with sufficient flexibility. In our everyday life the word is being replaced by the image. The oversimplified advertisement which can impress even a hurried traveler in train or car, the picture page telling a story through a single face, the portrayal of life in film or television are all evidence of the same role of the picture. Similarly, in the social sciences, the still and motion picture, as well as the graphic symbol, are serving to express the subject matter and give it life and dimension.

Might not the visual symbol become a new form of expression and investigation, as adequate to reflect the essentials of human society as the mathematical formula and geometrical design have become in expressing the world of nature? For the visual symbol, whether purely two-dimensional as in photography or graphics,

three-dimensional, or in motion (cinema, television), is able to convey the simultaneousness of past, present, and future, of here and there, which the single word tends to make us forget.

The picture, furthermore, carries with it emotional associations which fill the void of intellectual abstractions. It can be of such strength, impact, and simplicity that the accompanying word becomes secondary or even completely unnecessary. Then captions or commentary become merely "verbal aids."

In modern education word and picture should, therefore, form one whole, accompanying and complementing each other so as to render more fully the manifold richness of ideas and of the world around us. Not that we should underrate the importance of conscious formulation of verbal concepts, the traditional form of expression for great thinking. The aim is rather to enlarge the foundations of this expression, to guard against intellectualism devoid of emotional meaning to modern man.

The integration of visual thinking into education appears vital to assure the validity of present-day teaching in the world into which our children are stepping tomorrow and in which already they are frequently living with greater intensity than in the school. It might serve to convey to children the kind of understanding which gives intellectual and emotional stability in a world in flux and shield them against drifting helplessly in a stream of isolated "facts" and impressions.

The application of this purpose to the classroom will depend on subject and materials. I shall indicate three areas by way of illustration.

*Understanding the Picture*

The first step is to make the child aware that he sees, to make conscious what he sees. It is a basic characteristic of the picture that we absorb it through identification, that it appeals directly to our emotions, our senses, without passing through our reasoning. Yet the high point of our literate civilization is the conscious, abstract idea, the formulated concept. Here are two worlds apart, each incomplete without the other, each capable of fructifying the other, yet equally apt to drown and repress it.

We must be able to rise from the pictorial, identifying approach to the intellectual state of mind of verbal analysis. The ability to retreat into critical detachment and independence becomes ever more important. It is no longer enough to rely on our reflexes to shield us from the impact of the unsolicited, effortless presence of pictorial assaults in advertising, television, or the picture page. Both ears and eyes have a natural ability to discriminate, to overlook, and overhear. But the masters of images have learned how to outwit their enemy, how to take defensive reflexes by assault through surprise, sugar-coating, and sex appeal. The result is that many people, rather than observing critically, react purely on the level of enjoyment, judging a communication only from the point of view of whether it has given them more or less pleasure.

A test can demonstrate this. Let us assume we show a fascinating Grade B detective film to a group of children. Answers to the question: "How did you like it?" will hardly vary from those to: "What do you think of this film?" The mind is not ready for reasoned evaluation. To bring it closer to this stage, we must begin with factual recapitulation. "Tell me the sequence of events, but exactly." "What was the first scene, and the second?" "How were the different personalities characterized, in their speech, their dress, their movements?" "What about the sets, the lighting; how did they underline situations and action?"

Then comes the first step toward qualitative evaluation, the discussion of elements. "Was the principal actor believable?" "Would people you know have acted the same way?" "If not, why not?" "And the other actors, one by one, were they true, full persons, or what was lacking?" And so on, taking apart plot and sets as well.

One step further is designed to tear the veil off the seductive varnish of the picture. "Can you give examples of how the camera was used to produce emotional effects and associations?" Closeups, low angle shots, shots from the rear or side will be recalled (perhaps during a second screening), which were designed to produce fear, the illusion of greatness, cowardice, or shiftiness. Gradually the viewer will become aware how the director led him by the eyes. He will recognize as an illusion the idea that he was seeing the scene freely, guided by the normal wanderings of his own observation.

The same analysis can then be pursued with regard to lighting, music, and sound effects.

Only then, as a final step, will come the evaluation of the film as a whole, as a picture of life and people, as a moral thesis. A confrontation of a tape recording of the first spontaneous expressions of emotional reaction with the results of reasoned analysis will show the many layers which had to be uncovered to reach true consciousness. None of this need be done through didactic lectures. On the contrary, this process will only be effective in developing the minds of children. It will only be acceptable to them if they accomplish it by themselves in response to well-planned questions.

Such education applied repeatedly with regard to a film or a television program will eventually produce a habit of reasoning which leads to better understanding of what has been seen and serves as an effective shield against losing oneself completely in seductive identification. In schools and youth clubs where children regularly see the same films or television shows, such group discussions can be a vehicle to that state of individuality and detached awareness which alone can lead to maturity.

It may be argued that such rational analysis destroys the appeal and ruins the appreciation of any show. But long experience with painting, music, poetry, and other forms of art has shown that analysis, an attempt to understand the structure of the work and its process of creation, need not invalidate but rather can reinforce spontaneous appreciation. This method is dangerous above all to shallowness and falsity, to the second-rate and contrived. Real values and true quality of performance and presentation will only stand out the more by comparison with their claptrap rivals of fleeting popularity.

Only by breaking the spell of identification and illusion can we reach a state of mind in which we find deeper understanding and apply valid discrimination.

*Pictorial Expression*

From passive viewing through rational analysis we come to pictorial expression. Pictorial expression is distinct from pure, artistic creation, for it is the fruit of rational thinking and the translation of verbal concepts into visual symbols. An artistic

sense will be valuable in this, but the determining factor remains the ability to condense ideas, relationships, and factual accounts into pictures. Photography, advertisements, and graphic symbols are among steps on the ladder of this pictorial language.

Photography is a creative art, and only the greatest photographers are able to express in one picture the essence of what is portrayed. How then can it serve pictorial expression in an article dealing with visual communication? What we are thinking of here is not the taking of a picture but its use by students. Schools frequently assign students to collect photographs for illustrating certain social, historical, geographical, or scientific subjects. But are these pictures more than "visual aids"? Is an effort made to select only those which go to the heart of the subject? In other words, does such illustration lead not only to a more vivid concept of the subject but also to an understanding of the pictorial language itself?

There are many ways of keeping and presenting such photographic collections. Some students might confine themselves to gathering every available picture and placing it into an envelope with subject headings. A greater effort is required to paste photos carefully into a notebook, in a deliberate sequence and with original captions, to build a picture story. Selection is the third step. Here only those pictures are retained which truly succeed in telling the story and stand up artistically as well as technically. The student becomes picture editor. The final step is montage the mounting of pictures individually and as a composite, to attract the eye to the essential, to express basic ideas and information succinctly and artistically.

Pictorial advertising is an example of the translation of verbal terms into visual expression. The objective is stated verbally: a given product or idea must be sold to a given public. To translate this into visually effective terms requires not only a sense or knowledge of sales psychology but also the ability to compress a verbal message into simple and appealing pictorial symbols.

Exercises in pictorial advertising in which the student not only analyzes certain examples but becomes actively involved can be a further way of teaching him to see, to express himself visually and understand the visual language. Through paste-up jobs and fabri-

cation of simple posters, he can go beyond critical appreciation and try his own hand at the job. If such efforts are strictly evaluated, they can become a constructive part of visual education. "Does the poster express the idea clearly?" "Would there have been a simpler way of doing it?" "Does it communicate, appeal, transmit?"

What, it may be asked, does such training have to do with education, with the teaching and learning process of a school? It serves to give our children an intelligent understanding of the pictorial symbols, the visual language which is so influential in their environment, and communicates to them an ability eventually to express themselves in this language. More subtle, yet more fundamental: mastery of this language produces clear and focussed intellectual understanding.

A photograph or an advertising message is "good" only if it renders the essence of what it portrays and appeals effectively. Our intellectual and intuitive thinking must be directed toward grasping this essence if we wish to express it visually. What is more important in training a young mind than to give it the ability to discriminate between the essential and the incidental? How much wasted effort can be avoided, how much more deeply can a subject be seized, if children are schooled to penetrate to the heart and root of the matter from the very start. Here lies the difference between cumulative memorizing and memorizing grouped around comprehension of structure and fundamentals.

*The Graphic Symbol*

The climax of this process of employing visual expression to discipline the intellect is found in the graphic symbol. It is here where the circle closes from picture through word back to picture. The picture serves us first as a sensory, emotive reproduction of the impression. It may be a flower or the painting of a landscape. We then proceed to understand what we see and experience, to express it in verbal terms, supplementing rather than replacing the validity of the initial expression. The flower becomes a subject of examination and experimentation, the results of which are put down in an analytical classification and description. The landscape is analyzed to determine its geological characteristics, its vegetation and cultivation, its relationship to other parts of the country in terms of geophysical, social, and political geography.

And now we arrive at the third level. Here the visual symbol helps us to express in graphic terms the fruits of our verbal analysis. A sketch of the flower shows its process of growth and reproduction. The graphic symbol still resembles schematically the initial visual impression. The landscape becomes a map which defines its characteristics and places the region in its relationship with other parts of the country and the world as a whole. This graphic symbol is remote from the first impression and, therefore, more difficult to grasp for the untrained mind. Aerial photography might be said to give us the view of which the map is the schematic representation. But the very fact that the map by far antecedes the invention of such photography and that it is not limited by the same restrictions in scope and penetration is evidence that the map is fundamentally a symbol for intellectual concepts rather than a schematic rendering of visual impressions.

We use graphic symbols in the way postulated in this article, as an advanced tool of abstraction and comprehension, the further we move from the representational to the schematic. A standard map, while symbolic, nevertheless seeks to achieve the closest representation of reality. The more detail it contains (place names, roads and rivers, physical features, etc.), the more useful it is as a tool of orientation. But because of its very comprehensiveness, it fails to tell a particular story.

Let us take as an example the St. Lawrence River Seaway. A standard map will help us to locate it. But this is merely a starting point. The next step is a closeup detailed map of the area in which the seaway is being built, with an inset map which shows it in relation to North America as a whole. We are still in the stage of reference and orientation.

Let us assume we now concentrate on the impact of this new waterway upon existing lines of communication between the Middle West and the rest of the world. Immediately all that is not pertinent falls by the wayside. No need to show anything but key cities. Most roads, rivers, and railroads become unimportant. Yet prominently emerge the Mississippi with New Orleans, and cities such as Duluth, Fort William, Chicago, Cleveland, Buffalo, Toronto, Montreal, and Quebec, with their road and rail communications eastwards. A further elaboration might be to indicate through varying thicknesses of lines the relative importance in bulk, cost, and mer-

chandise value of the routes serving today for shipments in both directions and their comparison with the expected traffic on the seaway. There might then be added symbols of the principal products likely to benefit from shipment through the seaway. One could also indicate through cross shading the areas likely to be affected positively or negatively by the opening of this new route.

In this process the map becomes more and more schematic, until finally it can be almost completely dispensed with. The flow of products to and from the Canadian and United States Middle West by seaway or traditional route can be indicated simply through a set of arrows and symbols.

Any class which is given the assignment to prepare such a graphic presentation of the seaway story will soon discover how little it has understood its many implications, how many facts are lacking, how speculative are numerous arguments pro and con, and how interrelated are the many elements of this story. Each economic interest tends to see the project in its own light. Only by grasping it in its dynamic totality, in its historic motion, can we hope to understand its influence on the future of two great nations.

What is not understood clearly cannot be drawn simply. This is the experience of cartoonists and architects, of advertising designers and graphic artists. If we want to check whether a class has really understood a subject, why not ask it to put it down graphically?

*Group Work*

It is the purpose of this article to examine visual expression as content and method of education rather than as means of communication. We are, therefore, concerned with understanding the pictures created by others, as well as with expressing verbal concepts in pictures which are meaningful to those creating them. The problem of creating universally acceptable or understandable symbols is outside the scope of our consideration.

In suggesting visual expression as a means to seize the complexity and fluidity of verbal concepts, we do not assume that such expression will necessarily be in a form which is easily communicable to others. If it assists the individual student to gain deeper understanding of the facts and of the symbols expressing such facts, our purpose has been accomplished.

It has been my experience, especially as television news editor, that it is much easier to arrive at an effective visual representation of verbal reports through group work rather than through individual assignment. The process of devising suitable symbols is one of intellectual exploration rather than of artistic creation. Here the symposium of ideas and suggestions may prove more fruitful than the brooding reflection of an isolated person. In an educational situation it may, therefore, be accomplished more easily by giving an assignment to a group of students, or even leading the discussion of the class as a whole, than by asking each student to perform the work all by himself. Only after considerable training in this approach can we hope to use such assignments as individual tests.

*A Sample Application*

Let us take as an example conditions in the United States at the outbreak of the Civil War. What are the various ways in which these conditions might be expressed visually?

We might begin with the visual as illustration: a collection of photographs, of films and filmstrips which portray the scene, of documents and costumes. These can convey a more vivid picture of the times, can give the information freer access to the mind and the emotions, can open up the dusty covers of old books. But they remain "visual aids" in the accepted sense, aids to verbal presentation. They do not in themselves give us explanation and understanding. For this we turn to other images.

First of all there is the map. Maps can be helpful not merely to show the alignment of forces on the eve of the conflict, but to highlight the importance of the uncommitted territories whose future led to conflict and upset the status quo. Maps can also be the framework within which to illustrate the relative economic resources of the two parties and the conflicting interests in the outcome of the struggle on the part of Great Britain and the continent of Europe.

Then there are other graphic symbols which enable us, for instance, to express the social structure of the Northern and Southern States. What is the relative importance of agriculture, industry, and commerce? How is the population divided among those who derive their living from private property, wage labor, and slave labor? How did the situation in 1861 compare with earlier

times? What trends were discernible? Detailed statistics may, of course, be lacking on many of these points. The aim, however, is not numerical accuracy, or even numerical presentation, but almost impressionistic visualization of the over-all relationship of social forces.

And what was the role of popular vote in democratic government throughout the Union? How was the vote in the presidential election distributed territorially and by candidates? How was Lincoln elected with less than 40 per cent of the vote? Pie charts might show this.

Now from statistics to concepts. What were the issues facing Lincoln, and in what order did he propose to attack them? What were the alternatives facing the leaders of the South, the white population as well as the slaves? And what were the conflicting interests of business interests in New York?

To sum it up, what is the verdict of history? Can the issues which, in present-day view, led to the Civil War be expressed in simple graphic terms? Be it slavery versus free labor, Union versus States Rights, capitalism versus plantation feudalism, democracy versus aristocracy, confinement versus westward expansion, each calls forth a picture in our minds, a picture which symbolizes the issues for which millions died or suffered. In this manner we finally gain understanding of the forces at work, the dynamics of the time, the world in motion.

Here is a sample assignment which requires a degree of penetration and knowledge for which the student of this or any other subject is not always prepared. Apt as we are to lose ourselves in incidentals, to hold on to dates and personalities for want of a more cohesive picture of the whole, we find a challenge in the visual which is the greater, the simpler, the desired end result.

Some may see in the picture, the easiest, the laziest way of grasping the world. Yet it reveals itself also as the climax of knowledge, reasoning, and understanding. Simplicity is the starting point and end of all great thinking. If we train young minds to see with understanding, to experience in self-awareness, if we give them the ability to penetrate to the essentials, and to conceive the world in its constant growth and motion, we shall raise a generation better able to cope with our complex and rapidly changing civilization.

# FUTURE TRENDS IN TELEVISION TEACHING AND RESEARCH

• JOSEPH H. KANNER

*This paper presents an overview of the current status of television research conducted by the Department of the Army and suggests critical research areas and informational gaps in our knowledge.* *Joseph H. Kanner is chief of the Audio-Visual Applications Office, Army Pictorial Service Division, Office of the Chief Signal Officer, Department of the Army, Washington, D. C.*

THE ACCELERATED growth and increased acceptance of television as a teaching medium have exceeded the expectations of even its most enthusiastic supporters. The recent Stoddard report (4) describing the present uses and future potential of teaching by television is a source of satisfaction to those who for many years in the past advocated and predicted television's present role. These events should not obscure the many difficulties still attendant upon the use of television for teaching. Others have described these problems related to equipment costs, trained personnel, and administrative factors. The realm of application has revealed answers to many of these problems. Equipment costs, while not negligible, have been reduced through employment of simpler vidicon equipment and manufacturing efficiencies. A major problem is that of maintenance which, in some instances, equals or exceeds on-the-air time for the equipment. Strenuous efforts are being made to improve the stability and performance of circuits and various television components. However, I think we should realize that the complexity of television equipment will always require the services of skilled technical personnel for operation and maintenance.

Of more immediate concern are the uses and applications being made of television for teaching. There is no doubt that current teaching problems such as teacher shortages and physical plant

limitations, combined with television's potential for alleviating them, have accounted for much of the medium's recent spectacular growth. These factors will continue to provide momentum for television's growth for many years to come. The time is opportune, however, to capitalize upon this current enthusiasm for television by developing the medium's resources for improving teaching methods and techniques and extending its administrative advantages. Some new and challenging uses have been made of the medium, but there is need for increased imagination and daring in television's development to insure its further growth, acceptance, and use to meet civilian and military teaching and training requirements. I do not agree with those who conceive of television merely as a transmission facility. I believe it can be used to develop teaching methods in ways not possible in the conventional classroom. I will outline and discuss major current television applications as well as suggested areas of development.

*The "Cure-All" Concept*

The promise and performance of television have led to the belief that it can cure any and all educational problems. This belief can come very rapidly to the educator beleaguered by problems of teacher shortages, overcrowded classrooms, and similar pressures. "All we need are some cameras and receivers and we're in business!" Alas, he may find that some of his problems have been painfully increased. I refer particularly to ineffective teachers and teaching methods. Without corrective efforts, television cannot magically transform an ineffective teacher or presentation. On the contrary, the television camera can function as a bore amplifier. I have had occasion recently to observe instruction both in a classroom and later, unchanged, on television. If anything, the classroom defects were amplified on television. Other than closeups, no effort was made to utilize television techniques or to improve the teaching content of the presentation. Students who dozed in the classroom seemed to sleep even more profoundly when watching the televised version. There is no substitute for the hard work and skills required for effective teaching. Television can contribute to these efforts by skillful use of its presentational features, but when used merely as a transmission medium, it can exaggerate, not improve, ineffective teaching.

*The Television Teacher*

We can add to the growing mythology of television the various conceptions of what is required of the television teacher. Personality is a criterion word most frequently heard and translated into operational terms that include a ready smile, quick wit, and similar dimensions along the Hollywood definition of personality. It is also generally agreed that a good knowledge of the subject matter is a prerequisite of television teaching as it is for all teaching. Some years ago, while conducting a television research study, an occasion presented itself for testing some of these conceptions. We had previously prepared and tested the use of television for presenting electronics instruction, using experienced instructors. The scripts for these presentations had been prepared on a prompting device, and tests had been developed and used for the major aspects of the study which was concerned with using television to reduce teaching time. I suggested that we find someone who had never taught before and was not familiar with the specific contents of the hours we were teaching. An enlisted man was found with these qualifications and we gave him two hours of rehearsal for each two hours of instruction we planned for him to teach. He read from a prompter until the director felt his delivery was adequate. We had him teach these two hours of electronic instruction to a number of classes and then gave the students the tests developed for these subjectmatters. The tests indicated that these students learned at least as well from this "naive" instructor as others had learned from instructors teaching a year or more.

At other times we found that it took as little as two hours to retrain experienced instructors for teaching new hours of electronics information. Tests of these retrained instructors indicated that they taught at least as well and, in some instances, better than instructors who had been teaching these hours for a year or more. In a recently completed study, we again selected two military personnel who had never taught before and gave them about 12 hours of rehearsal for teaching eight hours of electronic subjectmatter. I expect to report the results of this and other aspects of the study in a future issue. But it is interesting to note that it was difficult to distinguish these two instructors from those who had been teaching a year or more. I recall one instance in which I asked an experienced instructor, who was unaware that these were new in-

structors, to watch them over television on the first day they were teaching. He thought their teaching procedure satisfactory and estimated they had been teaching six months or longer. When told that this was their first teaching experience after 12 hours of preparation, he shook his head and walked off silently.

These findings have important implications for both military and civilian teaching situations. In the Army, which has the constant problem of replacing or finding competent instructors, this technique of preparing an effective teaching presentation and then qualifying new instructors in a comparatively short time shows promise of alleviating many instructor training problems. Of importance is the technique's potential for reducing or eliminating the period of time when a new instructor achieves the skills and effectiveness of the experienced qualified teacher. I believe this method also can find application in the training of civilian teachers. Many civilian users of television report that inexperienced teachers appear to benefit by watching an outstanding colleague on television. This method would go further by using the materials of these outstanding teachers for training inexperienced ones.

When reporting these findings, I have received a variety of reactions. Many cannot reconcile the results of this rapid training method with their previous ideas on the lengthy time, preparation, and so-called personality factors which enter into effective teaching. This method does not eliminate the preparation and knowledge necessary for good teaching. The materials have to be gathered and prepared by competent personnel. But once effective teaching presentations have been prepared (and in the case of our studies, tested for effectiveness and improvement), then it may be possible for an inexperienced teacher to be trained quickly for presenting them over television. I would like to see a replication of our military findings by a civilian institution using television for teaching. If successful, I believe it would be followed by the concept of a group of highly skilled personnel preparing and testing effective teaching presentations to be presented by other less highly skilled or experienced teachers.

### *The Experienced Instructor*

One of the important uses of television has been to utilize qualified, experienced instructors to reach large groups or a number

of classrooms. This procedure permits more effective utilization of teaching resources. It has been our experience, however, that a teacher who has been effective in the classroom does not always make a successful transition to television teaching. This has been particularly true when an experienced instructor is permitted to teach over television without a prepared script. Generally, the rationale for this procedure is that since the instructor has been teaching a particular subject for many years and has his presentation well developed, why waste time in preparing a script and having him follow it. We have found in Army applications that this method does not always work well. It poses problems for the director and cameramen in directing camera movements and timing. More important is the effect upon the instructor. Years of classroom experience have led to an interplay between him and his students. His teaching approach, rate of speech, and similar factors have been determined by student cues. A puzzled look from some of the students may cause him to stop to repeat or further explain something he has just said. In the isolation of the studio without this student-teacher interaction, the experienced instructor may feel lost—his "timing" is off because the supporting classroom cues which normally govern his pacing are missing. This factor may account, also, in our finding that new or inexperienced instructors may more readily adapt to television teaching than an experienced classroom teacher.

However, it is possible to provide the experienced teacher with the cues needed for effective television teaching. Our procedure has been, first of all, to work with a detailed script. The first script may be a verbatim transcription of the instructor's presentation normally given in the classroom. This material is placed on a prompter and after some rehearsal a number of trial tests are made over television to students. During these trials, observations are made in the classroom of overt student reactions. Whenever possible, tests are given to measure the teaching effectiveness of the presentation. With this information, the director and instructor evaluate the presentation, making changes in content, adding any required teaching aids, eliminating material indicated as ineffective by the tests, and determining speaking pace. When completed, the new script is placed on the prompter, and the director can pace and cue the television instructor. Where speaking rate has to be in-

creased, or slowed down, the prompter's turning rate can be varied. By various familiar hand signals, the director also provides additional cues to the instructor. Very often classroom observation and testing continues with subsequent script and timing changes to obtain as effective a presentation as possible. In addition to the improvements in teaching effectiveness, I have seen this technique greatly improve the "morale" and technique of television instructors.

A special problem arises when television is used to teach motor skills, such as, in the Army, machine gun disassembly or radio alignment. When used correctly, this application of television can add considerably to one's teaching resources. One procedure has been to provide each student, for example, with a radio receiver and alignment tools. A television monitor is placed for about every three students. The television instructor then explains and demonstrates alignment procedures. He then asks the students to follow him as they align their own sets.

It is generally agreed that during the acquisition of new skills it is important to prevent or "extinguish" wrong responses and strengthen the correct ones. In this situation, television permits tight control over student responses and provides positive guidance in making correct responses. To achieve similar results in the classroom would require almost a 1 to 1 ratio between student and instructor. However, teaching rate and timing for television instruction become very critical factors in this type of application. For example, the step-by-step guidance must be paced so that it is not so fast that students fall behind the instructor. One technique we have used is to station an observer in a strategic place in the classroom with a telephone connection to the director in the studio. He then reports on student performance and coordination with the television teacher's instructions. A potentially effective procedure may lie in a recently developed camera-monitor chain in which a camera is placed in a classroom and the studio instructor can observe student reactions on a nearby monitor.

A procedure related to the general problem of teacher-student interaction has been use of students in the television studio or televising from an on-going classroom. From our experience in this type of television application and information from other television users, I believe this is one of the worst uses of the medium. From

a teaching viewpoint, it compounds the numerous classroom distractions which television, properly used, can so effectively reduce or eliminate. The presence of television equipment can, until students become "television-wise," distract attention. More important, outside viewing students view instruction not necessarily geared to their needs nor incorporating effective television techniques. The instruction can be perceived as detached or "second-hand."

*The Question and Answer Problem*

One of the apparent drawbacks of television teaching is the difficulty of conducting question and answer periods between the teacher and students. It is technically possible to install two-way communications systems between the television studio and the classroom. This procedure has been followed in a number of military and civilian applications of television with various degrees of success. By success I do not refer to the technical aspects of two-way communication, but to the returns in learning and teaching effectiveness achieved by this method. One of the first reports on this problem is described in a Navy television study (3). The report indicated that the method left much to be desired in terms of teaching effectiveness.

When conducting Army studies in 1953, we were forced to eliminate two-way communication because of technical and time limitations. It was found that eliminating question and answer periods both in the television and regular classroom situations did not appear to have any detrimental effects upon learning. In later studies, this procedure of eliminating questions and answers further indicated no reduction in learning with the advantage of permitting reductions in teaching time through the elimination of such interplay between instructor and students. While these studies were suggestive in their implications for the question and answer procedure, they were not designed to specifically evaluate it as a teaching method.

A discussion of the pedagogical background and rationale of the question and answer technique would be beyond the scope of this paper. I suggest, however, that a series of studies on the application and limitations of this procedure would have important implications for both television and other types of teaching.

Underlying the question and answer method is the recognition of the value of student participation in the learning process. Such participation involving student motor or verbal reaction to instruction aids acquisition and application of knowledge as well as student motivation or attention. For the television teacher, however, there exists a variety of participation methods which eliminate many of the problems accompanying the conventional question and answer session. These involve such methods as asking the student to call out, guess, or write down key materials. A previous paper (2) describes some of the methods used in Army television applications.

*Reducing Teaching Time*

The "transmission" concept of television regards the use of the medium as merely that of presenting existing types of instruction. In this use, only the administrative advantage of television, which permits large groups or numerous scattered groups to be reached, is employed. This concept, I predict, will hinder the development of television. It does not encourage the adaptation of teaching materials and methods to the requirements and advantages of television. One of these advantages is the reduction of teaching time, as compared with conventional classroom instruction, without impairing teaching effectiveness. We have found it difficult not to make such reductions. For example, in a previous study (2) the design required comparisons between television and classroom instruction, in which teaching time had to remain constant for both methods of teaching. The television director found it a trying experience to keep the television presentation from being as much as 10 minutes shorter than equivalent classroom presentations. Contributing to this difficulty was the fact that the television cameras were eliminating the need for the instructor to do many things. In the classroom, for example, the teacher would have to walk over to a chart, point to certain materials, and similar activities. On television, these activities were replaced by camera movements. In later studies, where specific efforts were made to reduce teaching time, savings ranging from 30 to 60 per cent were achieved with little or no decrement in learning.

Basic to the achievement of reductions in teaching time by television must be the orientation that such savings can be achieved. Following this, the particular aspects of television which facilitate

such reductions must be recognized. From a learning viewpoint, my orientation has been that material which is irrelevant must be eliminated. Most military instruction follows a lesson plan stating the objectives of the instruction. A particular hour of instruction is selected for time reduction. A verbatim record of the instructor's presentation when giving this hour is prepared. A test is also given to the students on the effectiveness of this presentation. The test is based on the lesson plan objectives and not on the instructor's material. The instructor's verbatim presentation is examined in relation to the test results and the lesson plan objectives. Material which does not appear to contribute to mastery of the lesson is eliminated. Random repetition is also omitted. Weak teaching points are also noted. It should be noted that at this stage many of the reductions or eliminations can be applied to any form of teaching. Television advantages appear in certain presentational techniques. For example, it may be found that repeating an item of information three times proves to be effective for teaching that item. In the classroom, this repetition is generally achieved by the teacher verbally repeating the information in succession or scattered through the lesson. On television, this repetition can be achieved simultaneously by having the audio portion contain the information and at the same time, by a superimposure or chart, present the same information visually. It is difficult to duplicate television's *audio-visual* informational potential. The student can receive the same information through two sensory channels.

Perhaps the most important feature of television is its ability to focus upon *critical* aspects of learning. Operating on the assumption that irrelevant material and information should be eliminated from instruction, I exclude such things as classroom stimuli and the instructor's appearance. Most classrooms unavoidably contain such irrelevant and distracting materials. By focusing the television camera on that which is being taught, these distractions are eliminated or reduced. For example, in teaching the function of a carburetor, the camera would be focused on this mechanism. The students would not see more than this and the instructor's hands pointing to various parts. The instructor's face and body would not appear, nor would any other material unless it were relevant to the instruction. In many of our television presentations, the instructor is never seen, after a preliminary establishing shot, during

the entire lecture. What the student hears is the instructor's voice reinforced by visual materials.

I have found that instilling the parsimonious attitude in television teaching personnel works wonders in reducing teaching time and eliminating unnecessary material. With the orientation of seeing how little time is needed to teach a specified number of instructional objectives, we have achieved striking reductions in teaching time.

*Student Aptitude and Television*

A major concern of educators has been the problem of teaching low aptitude students. Their presence in a class with students of higher aptitude has mutually deleterious effects familiar to most teachers. Any effort to gear instruction to their slower rate of comprehension serves to penalize the brighter student, who may become bored. Conversely, teaching geared to the lever of brighter students results in the lower aptitude students' failure to assimilate or comprehend what is going on. One of the primary problems here is an administrative one, the need for a selective process in which low aptitude students are not taught in the same group with brighter students. Following such a procedure, the next task is that of establishing teaching techniques geared to the capabilities of low aptitude personnel. A great deal of research has been devoted to the teaching problems of low aptitude students. I am suggesting that the television medium may present opportunities for a fresh approach to the problem. In one of our studies (1), we found that low aptitude personnel learned better from television than their counterparts did in the regular classroom. This was an unexpected finding which stemmed from a study not designed to examine this aspect of television, but the evidence for this finding was quite strong. I suspect that television's potential for combining and mutually reinforcing verbal and visual information was a contributory factor, but I have never had the opportunity to pursue these findings. As an area for suggested television research, I feel the exploration of television for the teaching of low aptitude students will prove rewarding.

Recent articles have also emphasized the neglect of the higher aptitude or gifted student. One of the problems here is capitalizing upon the ability of such students to assimilate rapidly great quanti-

ties of information. It is difficult to find teachers sufficiently skilled in developing the potential of these students. In working with television, I have been struck by its potential use for imparting difficult and challenging information at a greater rate of presentation within a given period of time than ordinary classroom methods.

There are several potentialities related to higher aptitude students which can be developed by television. One of these is the remarkable ability of these students to absorb and retain information. This aspect of learning has been exploited on many commercial quiz shows and has led to a disparagement of this "regurgitative" skill. Nevertheless, ability in any field, particularly the complex skills demanded in our society, must be grounded on a bedrock of sheer acquisition and retention of many facts. In meeting this requirement for presenting high aptitude students with as much information as they can absorb, television can be utilized. During our studies related to the reduction of teaching time by television, one problem with average students was that many of our shortened presentations were too concentrated, contained too much information for such students to absorb. We could have combined the information of two or three hours of electronics instruction into one, were the students able to absorb it. High aptitude students, I believe, would have been able to absorb such a concentration of learning.

This potential can lead to a number of promising research studies for higher aptitude students. In a normal four-year high school curriculum, for example, such students may receive the equivalent of an additional one or two years of instruction by concentrating and increasing the scope of information within conventional teaching time allotments. Another promising area would be the construction of special television courses in mathematics, physics, and other sciences for these students. One of the needs such courses would fill is that of providing teaching of a higher order and skill than ordinarily found and required for average students. The construction and presentation of such a "high-aptitude" instructional series by an educational television station would fill an important educational gap. I suspect it would find an interested adult audience also.

Perhaps the most important aptitude of bright students is their ability to grasp interrelationships or perceive implications. The

boundaries of this aptitude are not clearly defined, but it would include problem-solving ability. The utilization of television for developing this aptitude would require research skills of the highest order. Again, in working with television presentation methods, I was struck with the medium's flexibility and resources for combining audio-visual materials for learning. Working with comparatively simple subjectmatters, we found that television was superior to conventional classroom teaching for understanding interrelationships among moving parts (1). With more complex electronics subjectmatters, it was found that many difficult teaching points were facilitated by the use of "special effects" permitted by the television screen. We are familiar with many of these effects—split screen, superimposures, etc. In addition, many animation effects are available without the usual high costs associated with this procedure. I believe a fertile area of research exists in investigating the relationships and use of these presentation features of television to learning. I have already mentioned the promising finding of lower aptitude students learning better from television. The pursuit of these findings as related to the problem of higher aptitude learning would provide an important addition to the field of education and learning.

*Television Recordings and Films*

An important by-product of television is the television recording or kinescope. When properly produced, the television recording is less expensive than the motion picture because editorial costs are low or nonexistent, and many special effects can be incorporated electronically while the recording is being made without recourse to such expensive procedures as inserting optical effects. Advances in recording techniques have raised the quality of recent kinescopes to the point where most people would be unaware they were watching anything but a "regular" film. The recent development of tape recording equipment shows promise for increasing the flexibility of the television medium for producing and using film materials.

Existing evidence indicates that, from a teaching viewpoint, live television, kinescopes, and conventional films are equivalent. Any decision as to which to use must be based on administrative factors. Within the Army, for example, training films cover a range and amount of instruction well beyond the presentation scope of

existing or planned television facilities. Their major use is with standard projection equipment and they fulfill an important training requirement. We find, however, that transmission capabilities of television can be used to further the usefulness of training and informational films. By proper scheduling, a particular film is shown to a large number of classes simultaneously. At a given time, the instructor in the classroom turns on his receiver, the film is shown for say, 15 minutes, and then the receiver is turned off and the instructor carries on with his usual teaching procedures. This use of television and film has many advantages. The size of the audience for a film is generally much larger than when the standard projector is employed. The less critical lighting requirements of television viewing permit note-taking where necessary. Related to this is the eliminating of darkened rooms and the attendant ventilation and heat problems. Those who have had to endure film viewing in a conventional viewing room during the summer will appreciate this advantage. We have found that the number of film showings has increased. One factor may be that the instructor is relieved of the chores of procuring a projector, checking out a film, threading it, etc.

*Point of Application Review*

An interesting finding in one of our studies (1) was the fact that low aptitude trainees receiving one film review a month after original instruction closely approached the test performance of high aptitude students receiving only the original instruction. Related to this is the generally accepted finding that there is a rapid decline in retention following original learning. We have found that about a month later, any initial differences between methods of teaching may disappear and that there is no significant difference in retention.

One feature of most instruction is that the information imparted is not immediately used but may find application months later. This is particularly true of military instruction where the intervention of other requirements may result in a gap of many weeks before, for example, a graduate of the radio repair school arrives at an installation to assume his duties. This general situation underlies my use of the term "point of application review" or training. It may be assumed that the trainee reporting to his job

some time after he completed formal training has forgotten many of the things learned at school. At this stage, a review of many critical phases of his past instruction could improve his performance and usefulness. Some reviews might be achieved, for example, by a rereading of existing technical manuals and other literature. But such materials as trouble-shooting procedures, repair skills, and equipment features can better be demonstrated and reviewed by a film. If his school instructor were used in the film, I think it would further add to the teaching effectiveness and interest of a film shown to a former student many miles and months removed from the school.

Within the school situation itself, the use of review by television or film may be a valuable deterrent to the effects of forgetting. In addition, review may facilitate understanding of materials not achieved during original instruction. A further advantage may lie in permitting lower aptitude students better achievement by providing an extra opportunity to improve their learning.

*Television Research*

I have suggested a number of research problems, the answers to which I feel would be of importance not only to television but also to many educational problems. A question arises as to who will do these or other research studies. Since 1951, the military services have carried out many pioneer studies in television. One of the effects of these studies, within the Army, was the publication of the first regulation recognizing television as an acceptable military communications and training medium. While many military studies have application to civilian needs, they are generally limited to many pressing immediate military needs. We must look to civilian sources for support and resources in carrying out other types of television research. At present, foundation grants in television are oriented towards developing immediate application of television to such problems as teacher and facility shortages. We have built up a fund of research information which has facilitated this approach. But, as in many other fields, this fund will be rapidly exhausted if more fundamental research is not continued. One answer may be the granting of funds to a number of institutions and individuals to carry out specific studies. But a more satisfactory answer, I feel, would be to establish a center for these studies.

Such a research center would permit the carrying out and pursuit of a series of long-range studies not possible with sporadic "one-time" studies. Again and again, promising findings are not followed up because the research has terminated with a particular study or research effort.

*Summary*

This paper has attempted an overview of the current status of television teaching for the purpose of suggesting critical research areas and informational gaps. While television is currently growing at an accelerated pace, there is a continuous need for developing new uses and applications which will strengthen its acceptance and value as an educational medium. The need for increased research efforts, particularly from civilian sources, was stressed.

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# APPLICATION OF SOUND MOTION PICTURES TO RESEARCH IN CLINICAL PSYCHOLOGY

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*This paper reviews the research in clinical psychology conducted by the Instructional Film Research Program at The Pennsylvania State University.*

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DURING the past eight years the Instructional Film Research Program at The Pennsylvania State University has sponsored over 60 studies which have involved the use of films in various aspects of psychological research (1).

About 15 of these studies have related to the teaching of perceptual motor skills by means of films. Nearly 20 studies have dealt with conceptual learning. Other studies have been concerned with the use of films for restructuring individuals' attitudes.

It would appear that films have some important advantages for use as stimulus materials in psychological research, and that these have been exploited only to a small degree. Among the possible advantages offered by films as instruments for research are the following:

1. Defined variables can be built into films in a controlled fashion so that accurate comparisons can be made among the effects of several variables in different versions of a film.

2. Once constructed, the stimulus material in a given film remains constant so that it can be used repeatedly under a variety of conditions and, in so doing, the experimenter can be sure that his stimulus material is unchanged.

3. It is possible to present situations in films depicting complex human interactions in a way that would otherwise be difficult to

accomplish, and to study the dynamics of human interactions with or reactions to such situations.

4. It is possible to present situations in films which closely approach real-life situations and to use these as substitutes for actual performance tests.

5. Finally, the value of the film as a medium for recording behavior for subsequent analysis and interpretation should not be overlooked.

Among the studies using sound motion pictures performed at The Pennsylvania State University, a number have related to clinical psychology. It is the purpose of this paper to discuss these studies briefly and to point out some of the ways in which films might be used for research in psychotherapy, personality diagnosis, the selection, training, and testing of clinicians, and for recording behavior for analysis and interpretation.

## FILMS IN PSYCHOTHERAPY

Several studies in which films have been used for research in psychotherapy will be described first.

The earliest study along this line was one conducted by Mertens (7). The purpose of the study was to explore the possibility of using mental hygiene films to produce changes in attitudes toward the self and hence bring about improvements in personal adjustment.

Two hundred fifty-four college freshman women were selected as subjects for the study. They were divided into two groups, experimental ($N = 124$) and control ($N = 130$). At the beginning of the study all of the subjects took a battery of standardized personality inventory tests: the Minnesota Personality Scale for Women, the Bernreuter Personality Inventory, and Maslow's Social Personality Inventory for College Women.

A few days following the pre-testing, film showings began. The experimental group was shown a series of five mental health films at the rate of one a week over a five weeks' period. The control group did not see any of the films.

Four of the five films were selected from the well-known series of mental health films produced by the National Film Board of Canada. They included *Feelings of Rejection, Feelings of Hostility, Overdependency,* and *Family Circles.* The fifth film, *Preface to a Life,* was of a similar type produced for the National Institute of

Mental Health. All of these films deal with common personal adjustment problems in a realistic way and attempt to give insights into their causes. A week following the showing of the last film all subjects again completed the three personality inventories.

Analysis of the results indicated that on one of the scales, the Bernreuter B4-D (Dominance), the experimental group showed a significant movement in the direction of less dominance in comparison with the control group. On all of the other scales differences in gains between the experimental group and control group were small and not statistically significant. However, the gains were consistently in favor of the group which saw the films.

A second study along somewhat similar lines was conducted in 1955 by Harriman (4). The purpose of this research was to see whether group-centered psychotherapy and selected mental health films, used alone and in combination as treatment methods, would bring about measurable changes in certain attitudes of inmates in a penitentiary. The specific attitudes studied were:

1. Enjoyment of interpersonal relationships as measured by a revision of Morris' Gripe Scale (e.g., the guy that gripes me: never drinks, loves to talk about himself, always tries to get out of work, etc.)
2. Emotional stability and maturity as measured by Cattell's Ego Strength Scale
3. Strength of character as measured by Cattell's Super Ego Scale
4. Understanding of the motives and feelings of others as measured by Edwards' Intraception Scale
5. Personal worth as measured by Edwards' Abasement Scale
6. Hostility as measured by Edwards' Aggression Scale.

The subjects consisted of 81 male inmates at a state penitentiary. They were assigned randomly to four experimental conditions as follows:

1. Group therapy only
2. Film showings only
3. Films followed by group therapy
4. Control or no treatment group.

The groups met twice weekly for a total of 16 sessions. The groups which saw films viewed 16 selected mental health films

during this period. Those which saw films only viewed them without discussion. The subjects who saw films followed by group psychotherapy were free to discuss any film in the subsequent therapy session if they so desired. The therapy was essentially nondirective in character.

The 16 films were selected as ones which were nonmoralistic and documentary in nature, and, in general, they used the realistic case study approach to give an understanding of factors contributing to delinquency and other aggressive behavior. Such films as *Angry Boy, The High Wall, Children of the City, Palmour Street,* and *The Quiet One* were included in this series.

The same tests were administered as pre- and post-tests, and analysis of variance was applied to the differences between pre- and post-tests for the several groups. In no instance did the differences among the treatment groups on any of the scales reach acceptable levels of significance. On the other hand, Harriman amassed a great deal of qualitative information about how inmates react to certain aspects of group therapy and to certain kinds of films. For example, he points out that mental health films on subjects other than delinquency are more conducive to discussion by reason of their being less threatening, and that motion pictures which place all blame for delinquent behavior on environmental factors may encourage projection.

Finally, in connection with the application of films to therapy, the study by Stein (10) should be described. This study was an attempt to use mental health films in the treatment of hospitalized mental patients.

The study did not try to measure therapeutic progress of the patients. Rather, it endeavored to relate the factor of *identification* of the patient with any of the films to the amount and type of discussion which came out in a subsequent therapeutic interview. For purposes of the study *identification* was operationally defined as "the verbal report of the subject that he perceives a similarity between himself and some element in the film he has been shown."

The question may be restated in the following form, "Is there a relationship between identification of mental patients with some aspect of a mental health film, and the degree to which they discuss themselves and their problems in a post-film interview?"

The subjects were 36 hospitalized mental patients. The four films used were: *Feelings of Hostility, Feelings of Rejection, Over-*

*dependency,* and *Feelings of Depression*—all productions of the National Film Board of Canada.

The subjects, either singly or in small groups of two or three, saw the films in a random order. Immediately after a film showing, each patient was interviewed by the experimenter, and the contents of the interview were recorded on tape. The interval between film showings for a patient was one week.

The follow-up interview sessions were essentially nondirective in character, but if no spontaneous comments occurred, a few "starter" questions were used (e.g., Did you like this film? Have you ever known a person like John?). Interview sessions lasted one hour.

The method of analysis involved subdividing the interview material into units, classification of the units, and tabulation of frequencies within each classification. The *independent clause* was the unit chosen, and the categories chosen for classification included:

1. Statements of the patient's problem
2. Statement of the patient's interpersonal relations
3. His reactions to his interpersonal relations
4. His self-concept
5. Understanding of himself.

Another dimension of categories included reactions to the film in the following terms:

1. Identification with any factor in the film
2. Emotional reactions to any factor in the film
3. Interest in any factor in the film
4. General discussion of any factor in the film.

The results of the study appeared to support the following conclusions:

1. The perception of similarity between a patient and certain elements in a mental health film appeared to be related to the amount of discussion by the patient about his own life.

2. The film, *Feelings of Hostility,* produced more discussion by the patients of their own lives than did the films, *Feelings of Rejection, Overdependency,* and *Feelings of Depression.* This suggests that certain films have more stimulus value in producing discussion than other films do.

3. In terms of both age and sex this study demonstrated that psychiatric patients did not identify more with a film protagonist who is physically like themselves (e.g., in age or sex).

4. The intelligence of the patient did not appear to be related to whether or not the patient perceived similarity between himself and elements in the film.

5. The acutely ill patient often appeared to be unable to differentiate much of what appeared in the film from his own life. There was no clear line between the unreality of the film and the real world in which he was functioning.

6. Even in those cases where there was no physical similarity between the film protagonist and the patient, the patient often perceived a relationship and used it to discuss his problems.

The studies mentioned here are admittedly exploratory. They suggest, however, that the use of films for therapeutic purposes would repay further investigation. As in most studies of the effectiveness of therapy, a difficult problem is that of selecting or devising objective measures that will indicate improvement in adjustment and that will differentiate the effects of several methods of therapy.

## FILMS FOR CLINICAL DIAGNOSIS

A number of attempts have been made to use films for identifying and diagnosing maladjustment. Several studies have been conducted on the use of films for presenting group projective tests for adults. Among those conducted at The Pennsylvania State University is that by McIntyre (6), who tested motion picture versions of the Thematic Apperception Test. There is not space to describe all of these studies here, but mention should be made of one completed in the spring of 1956. This investigation by Haworth (5) sought to determine the effectiveness of a filmed puppet show as a group projective technique for use with children. In addition, an attempt was made to assess the attitudes and feelings toward family relationships that might be revealed in the children's responses to this particular film.

The study is an extension of the work by Woltmann at Bellevue Hospital in the use of puppets for diagnosis and therapy. The puppet play, *Rock-a-Bye Baby*, written and produced by Woltmann, was filmed and used as the stimulus material in this study.

This film was shown to 250 children. Approximately 100 six-year-olds comprised the main sample, and there were approximately 50 at each of the four-, eight-, and ten-year levels.

The film was shown up to a dramatic point and stopped. Then the group of children (usually 10 to 12 in number) was asked to finish the story. The presence of the group did not appear to have any adverse effect on individual responses, but rather served to encourage shy children to participate.

Following this break, the remainder of the film was shown and each child was asked individually a set of 13 questions designed to tap various attitudes and feelings (e.g., Which one of the people in the show would you most like to be? What did Casper think of his mother? Why did Casper try to get rid of his baby sister?).

During the film showing observers noted behavioral responses on a special form. In addition, infra-red movies were taken of some groups during the film showings for subsequent analysis. This technique will be discussed later.

To check the projective effectiveness of this film, the sample of six-year-olds was divided into two groups on the basis of a known variable: the presence or absence of a younger child in the family. Significant differences with respect to attitudes toward the baby and parents were found in the responses of the two groups. Children from the nonsibling group tended to show stronger negative feelings towards the parents than toward the baby, whereas children from the sibling group showed more negative feelings toward the baby than did the nonsibling group.

Several indices and scoring methods were developed for use in scoring and analyzing the children's responses:

1. A Sibling Rivalry Index

2. An Autoerotic Index based on the responses of a known group which exhibited autoerotic habits

3. A Super Ego Scale, which was scored for evidences of guilt feelings.

Further validation of these measures was obtained from drawings made by the children, from teachers' ratings, and case histories of some clinic cases.

Haworth's evidence indicated that the film test does elicit useful responses from young children and that it is of value in screening and personality assessment. It is hoped that this film will be made

available through the Psychological Cinema Register for further research uses.

While discussing studies of the personality of children involving the use of films, it may be appropriate to refer to the study conducted recently by Siegel (9) at The Pennsylvania State University.

This study was a beginning attempt to attack the controversial issue of whether a film depicting aggression functions as an instigation to real acts of aggression on the part of the viewers, or whether film-presented aggression acts as a catharsis serving to reduce aggressive drive.

In this study the play of four-year-old children was observed and compared, following the viewing of two different animated cartoon films. One film, *Ace in the Hole,* concentrated on a theme of violence and interpersonal aggression; the other, *The Little Red Hen,* had little or no violence or aggression in its content. The assumption that the first film mediated much more fantasy aggression than the second one is supported by the fact that the children showed significantly more anxiety during the showing of this film.

Twenty-four children participating in like-sexed pairs saw the two films at two different sessions several days apart. The order of viewing was reversed for half of the group.

After each film showing the two children were left alone together in a playroom with a number of toys suitable for eliciting various kinds of behavior. Observers watched the children for a period of 14 minutes through a one-way vision screen and scored their behavior for incidents of aggression and evidence of anxiety and guilt. In addition, the play was photographed through the one-way screen for subsequent study.

Analysis of the data showed that significantly more aggression was exhibited in the first session than in the second, regardless of film, and for both sessions combined, boys showed significantly more aggression than girls. However, the difference in effects on aggressive behavior of the two films was nonsignificant.

Siegel points out that the appropriateness of the measure is open to some question because the aggression scores seem to reflect strength of aggressive habits rather than strength of aggressive drive. Further research using films with more violent themes and older children is planned.

## USE OF FILMS FOR SELECTING AND TRAINING POTENTIAL CLINICIANS

A good deal of thought has been given to the use of films for presenting in a standardized way complex personal interrelationships for the purpose of having individuals make judgments about other people's behavior, motives, attitudes, and personality traits. It is hoped that, in this way, it might be possible to select people for work which involves the use of these kinds of skills (e.g., clinical trainees).

As an approach to this problem a study was conducted by Gregory (3). The specific purpose of this research was to investigate the relationship between the ability to judge the interpersonal relationships of others and certain psychological characteristics of the individual who makes these judgments.

One hundred twenty students enrolled in an introductory course in psychology were selected as subjects for the main part of the study. Two motion pictures presenting much complex personal interactional material were used. They were *Feelings of Hostility* and *Feelings of Depression.* The sections at the end of each film describing the dynamics of each case were not shown to the subjects, but were used along with other material in the films as a source for constructing a criterion measure containing 60 multiple-choice items, 30 on each film. These items sampled personality dynamics, attitudes, conscious and unconscious motives, identification and description of traits, and understanding of motives (e.g., Claire protected her self-confidence by . . . . .; John felt his wife didn't like him because . . . . .; When Claire answers correctly in class, she feels . . .). A panel of experienced clinical psychologists made judgments as to the "correct" response to each item on the test. This procedure was intended as a form of validation of the test.

One week prior to viewing the films, the subjects completed a battery of tests designed to measure objectively certain aspects of intelligence, attitudes, and temperament. These tests included: Form B of the Minnesota Inventory of Social Attitudes, a Test of Ideational Fluency suggested by Johnson and Reynolds, the vocabulary section of the Nelson-Denny Reading Test, the California authoritarian-democratic attitude scale, and the Guilford-Zimmerman Temperament Survey. A week after taking these tests, the subjects saw the two films, and immediately after the showing completed the criterion test.

A multiple correlation technique was used in analyzing the data. A multiple R of .47 was obtained, which is significant at the one percent level. It was found that the vocabulary test, the authoritarian scale, and the objectivity test of the Guilford-Zimmerman Survey contributed most highly to the prediction of the criterion.

Gregory concluded that the use of the films and the associated test is a useful criterion for research in the area of social perception.

The last study to be described here is a follow-up study by Rutledge (8). The purposes of this study were: (a) to determine whether or not training in itself helps relatively naive individuals to gain skill in judging interpersonal relations, and (b) to evaluate the efficacy of two training methods designed to accomplish this end.

Students in an introductory psychology course served as subjects. They were randomly assigned to six groups to provide for comparisons between two instructors and three training treatments:

1. Lecture presentation
2. Case history discussion
3. No training (control groups).

The experimental design was arranged to permit an analysis of covariance.

First, all subjects took an initial test before any training was given. This pre-test followed the model developed by Gregory mentioned above. The subjects saw excerpts from two films depicting varied human interactions. These were taken from *Combat Fatigue and Irritability* and *Remember the Day*. Immediately following the film showing, all subjects took a multiple-choice test containing 58 items designed to tap judgments about the interpersonal relationships depicted in the films.

The four experimental subgroups were then subjected to the two training methods. Each of the two methods was presented by two different teachers. The lecture method covered the more important aspects of man's behavior in the human interaction context, including the concepts of social perception, need and drive, stress, frustration and conflict, feelings and emotions, etc. The case-discussion method involved what is generally called student-centered teaching. Fifteen case histories in mimeographed form were assigned for outside reading. The cases dealt with disturbances in everyday life. In the training sessions these cases were discussed and the students were encouraged to assume responsibility for

achieving "solutions" to the case problems. Each training method included seven one-hour sessions spread over three and one-half weeks.

At the conclusion of the training period all subjects took a post-test of interpersonal judgmental accuracy, which was similar in format to the pre-test, but which used excerpts from two different films: *Miracle of Living* and *City Across the River.*

Analysis of the data revealed no significant differences between the two instructors. The interaction between methods and instructors was also nonsignificant.

Further analysis indicated that the control group (no instruction) and the case-discussion groups were not significantly different, but that the lecture-taught group was superior in performance to both the case-discussion and control groups at better than the five percent level of significance. Rutledge concluded that, in a seven-hour course with psychologically unsophisticated students, the lecture method developed skill in making interpersonal judgments, and that this method was more effective than the case-discussion method.

It is believed that criterion measures of the kind developed for the two studies just cited offer considerable possibilities for research on problems of selecting and training individuals for clinical work. New techniques, however, need to be developed to ensure the validity of such tests. Such techniques might take the form of asking subjects to predict outcomes of film-presented behavior. Subsequent to the prediction, the actual behavioral outcomes could be shown.

## NOTE ON PHOTOGRAPHIC TECHNIQUES

In two of the studies described above, those of Haworth and Siegel, special photographic techniques were used as a means of recording overt human behavior for subsequent analysis and quantification. Both applications involved the use of memo-motion photography (2), a technique by means of which one photograph per second is taken on 16 mm film. This frequency is sufficiently fast to record most kinds of overt human behavior and, at the same time, considerable economy of film results. A 100-foot roll of film will record slightly over one hour of activities. The film is analyzed subsequently by viewing it one frame at a time in a special single-frame projector or in a standard film editor.

In the case of the Haworth study the photography was undertaken during the projection of a film under darkened room conditions. High-speed infra-red sensitive film was used, and infra-red illumination was provided by means of two infra-red lamps with ruby glass directed against the ceiling of the projection room. A lens aperture of f2.8 was used.

In the Siegel study, which entailed photographing through a one-way vision screen, the memo-motion technique was again used. On this occasion the playroom was illuminated to a level of about 150-foot candles, and Eastman Tri-X high-speed film was used in the camera. The lens opening employed was f2.8.

The experience in both of these studies was that the memo-motion photographic method of recording overt behavior provided a wealth of data for subsequent analysis.

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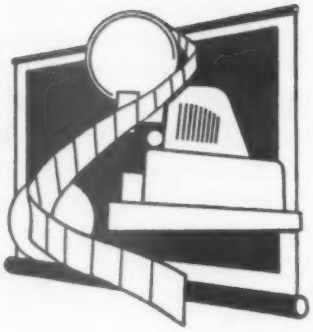


# FILM

• ROBERT W. WAGNER

## TWO TRIBUTES TO TEACHERS

The average American, in his public school experience, comes into contact with from 20 to 40 teachers. While it takes many teachers to help the student get the information and understandings he needs, there will always be those few, those indispensable few, who made the real difference. There will always be the five or six who really gave us the chance, the incentive, the will to go ahead and learn and act on our own.

As we look back, how many of these teachers do we remember? How many have we taken the trouble to acknowledge, directly or indirectly, for the positive influence they may have exerted on our lives? How many teachers with perhaps a half-century of service to thousands of young people have yet to receive a single note of appreciation from a former student?

Such a note of appreciation, rarity that it is, expressed by Billie Davis in a short story which appeared in the *Saturday Evening Post*,[1] has been made into a film. And while this film, sponsored by the NEA, was winning a Golden Reel Award at the Fourth Annual American Film Assembly in April of this year, a new NEA release—the seventh in a series on teaching and learning in the American public schools—was in the last stages of production.

Robert W. Wagner is professor and director of motion picture production at Ohio State University.

[1] "I Was a Hobo Kid," *Saturday Evening Post*, December 13, 1952.

Both films merit attention as tributes to the public school teacher of today and tomorrow.

*A Desk for Billie*,[2] the Golden Reel award winner in the Education category, was produced in 1956 as part of the Centennial Celebration of the National Educational Association. Based on the story, "I Was a Hobo Kid," it is an autobiographical account of Billie Davis, as a child in a family of transients—"rubber bums"—wheeling from place to place on the threadbare tires of a battered flivver, eating beans over an open fire, and camping on the outskirts of town in company with other migrant workers.

Billie, sympathetically played in the film by Nancy Pinet, is one of three children begotten of a selfish, ignorant mother and a shiftless father whose philosophy is to stay on the move and whose method is to flip a coin to determine the direction of that move.

The family income depends upon door-to-door sales of willow baskets made by the father, decorated with artificial flowers made by the mother, and peddled by the children. The Davises live in a tent, associate with other migrants whose negative attitude towards authority extends from law enforcement officials to social workers and teachers.

In their play, however, the children contrast their lives with those of "real people"—those who live in houses and wear clean clothes. Billie's yearning to find out more about "real people" begins to materialize when she learns that a Sunday School near the place where the family happens to be camping is free. She attends with the warning of her mother ringing in her ears: "Don't blame me if they laugh at you!"

The little tract that she brings home from Sunday School exacts from Billie a promise to herself that someday she will learn to read. An old-timer on the road helps her by advising her father that the public schools are both free and compulsory, and when the family puts down stakes in a town during carnival time, Billie is able to get her parents' permission to attend a nearby school. Watching the kids go off, the father turns to the mother and resigns himself by saying: "Well, Billie finally made it!" To which the mother doubtfully replies: "Guess it can't hurt her none!"

From this point forward, the story of Billie Davis is one of temporary residence in many schools, fragments of knowledge picked up, and, most important, the influence of a few good teachers.

[2] Produced by Agrafilms for the NEA. 57 min., color; sound. Sale: $325, color; $110 b&w from NEA Division of Press and Radio Relations, 1201 16th St., N.W., Washington 6, D.C. For loan and rental prints, contact State Educational Associations.

There was the teacher who helped her take the first stumbling steps in learning to read. The kindness of another teacher in another school helped the "dirty little gypsy peddler" feel like "real people." Yet another teacher noticed that Billie needed glasses and saw that she got them. It was a principal who, though harassed by the daily routine, still had time to recognize individual differences and, because he really believed that "the curriculum must fit the child," helped the now adolescent Billie work out a special schedule oriented towards a career in journalism and radio. And it was a thoughtful teacher who loaned her a decent dress to wear to the senior dinner party.

These few made a difference in Billie's life, and when she was finally lucky enough to spend her senior year in the same school, she had cemented enough of the fragments together with her own initiative and will to learn that she became editor of the senior yearbook, a member of the debate team, and a leader in other social and academic activities.

Much of the warmth and faith expressed in the original story happily comes through in the film. True, there are the thoughtless cruelties imposed by more fortunate children on the Davis "gypsies," because Billie and her sister wear tennis shoes. There is a suggestion of the difficulties created for school officials and teachers by transient students. There is the unchanging indifference of the Davis parents to the ambitions and futures of their children, with no sign of the "conversion" of the parents in the film itself. And there is the (perhaps) necessary deception of the boyfriend who takes Billie "home" to a false address from which, after the departure of her escort, Billie walks to the tent-dwelling of her parents.

Yet, there are moments to remind one of the fact that there seem to be enough people of good will around to make life tolerable and even highly liveable. There are the men at the garage who buy Billie's flower baskets for enough money to make it possible for her to get her first pair of "real" shoes. There is the housewife who gives the little peddlers some bread and jam; the old-timer whose age and experience make him unafraid to tell the head of the Davis household that no one can get along in this world without education. And, as Billie Davis concludes: "Wherever we went, no matter what we were, a school was always there—and a teacher, and a desk that seemed to be waiting just for me."

The point of view of this film has been summed up in a few words:

Schools should be dedicated to the proposition that every youth in these United States—regardless of sex, economic status, geographic location, or race—should experience a broad and balanced education which will (1) equip him to enter an occupation suited to his abilities and offer reasonable opportunity for personal growth and social usefulness; (2) prepare him to assume the full responsibilities of American citizenship; (3) give him a fair chance to exercise his right to the pursuit of happiness; (4) stimulate intellectual curiosity, engender satisfaction in intellectual achievement, and cultivate the ability to think rationally; and (5) help him to develop an appreciation of the ethical values which should undergird all life in a democratic society.[3]

If this film does nothing more, it reminds us that unusual, and too often unappreciated, educational facilities do exist in the United States, and that it is the responsibility of each individual teacher in this system to remember that he or she, as a human being and as an educator, may be, by word or deed, one of the few, "those happy few," who might make the difference in the life of a young person.

*Not by Chance*,[4] the newest NEA film, picks up the theme of the importance of the teacher. Produced in cooperation with the American Association of Colleges for Teacher Education, this presentation enlarges upon the thought that we must not only have free education and good schools but also the best of teachers for our children.

The contribution of the teachers college to this objective is exemplified by Donna, a young, wide-eyed teacher-to-be, as she enters her training period. The college is pictured as one which evaluates past records, conducts entrance examinations in math, science, English, and the social studies, and explores, through psychological tests, the candidates' abilities and aptitudes for the teaching profession. Donna's speech ability, for example, is analyzed, and a report on her general physical health is made.

Donna wants to teach science. Her training includes "a broad and thorough knowledge of subjectmatter." But, it is pointed out, she must know more. She learns to make diagnostic tests and measurements. She recognizes individual differences, watches good teachers in the schools, and sees how the skillful, experienced teacher involves students in the learning process. Donna learns about the practical, self-assuring device known as "the lesson plan," and becomes aware of the importance of associating herself with professional organizations in the field of education. The time-worn device of the football game is unfortunately resorted to as an

[3] *Education For All American Youth*. Educational Policies Commission, NEA, and the American Association of School Administrators, Washington, D.C., 1944. p. 21.

[4] Produced by Agrafilms for the NEA. 28 min., color; sound. Sale: $275, color; $175, b&w from NEA Division of Press and Radio Relations. Loan and rental prints available from State Educational Associations.

example of extracurricular activities "equally important" to her college career.

In the course of her college experience, Donna is brought into contact with a variety of teachers and teaching materials. "Teaching has come a long way since the teacher's only tools were the map and the blackboard," the film explains. "Alertness to teaching as well as to subject matter is a first step towards her professional career."

Audio-visual methods of instruction portrayed include motion pictures, filmstrips, recordings, feltboard, and closed-circuit television. In the latter situation, Donna is seen in a rather static and somewhat uncomfortable role as student floor-director in the university's television studio. It might have been better to show her learning to use these "new tools" in a classroom situation rather than in the production process.

Particularly well done, however, is a sequence showing Donna accompanying a group of children on a field trip to a student camp where she learns more than her young charges about wildlife—an experience which teaches her that the good teacher does not pass along her own fears and prejudices to her students.

Also skillfully done is a demonstration sequence on the teaching of sound vibrations by the teacher under whom Donna does her practice teaching. The sequences on audio-visual materials of instruction, the field trip, and the demonstration, are good examples of audio-visual communication as it should be applied in a good teacher training institution.

The thought of practice teaching gives Donna certain qualms, but these appear to be quickly dissipated when she takes her assignment in a junior high school with a beautiful physical plant, a sympathetic PTA, a capable, understanding supervising teacher, and a class which gives her its undivided attention and respect.

This, then, is the picture—good teacher candidates, carefully selected, with a broad, humanistic background and a practical knowledge of the goals, methods, and materials of instruction. And if Donna comes out at the end of the film, still dewy-eyed, and as innocent and sweet-looking as when she entered teachers college as a freshman, her "photogenity" and the difficulties of condensing and picturing the physical and mental effects of four years of maturation in a 28-minute film must be held mainly responsible.

The impression that is likely to be created by this film, unreleased and hence untried at this writing, is something of the impor-

tance of getting good, well-educated teachers for our public schools, and for our teacher training institutions as well, and the kind of well-planned, tastefully constructed physical plant pictured. If what is shown is somewhat idealistic and unrepresentative, at least the point is made that these things come not by chance.

In the final words of the film:

> For a hundred years and more all the knowledge patiently gained by teachers, all their understanding of children and how they learn, all the efforts to improve the quality of their own teaching have been gathered to create a constantly growing legacy in our colleges for teacher education.
>
> From these colleges a continuing replenishing force of new teachers goes out each year to the schools of America. For it is first as children that the opportunity for growth and learning is freely offered to every American.
>
> But even as our children grow and learn and are influenced by great men of history, they are being influenced even more deeply by other great Americans—thousands of great professional teachers who are ever enriching our heritage—a heritage which is America.

And so, the NEA has produced two films both of which are, in a sense, a tribute to the American teacher. *A Desk for Billie,* the story of a child's thirst for knowledge which is slaked despite all obstacles, is equally illustrative of the fact that a good teacher, sometimes in a single, brief contact, and in what may seem the slightest act of kindness or wisdom, may significantly affect the course of a human life. *Not by Chance* goes on to show that such teachers and such schools just don't *happen*—and won't happen—unless the people of a community really care about their children, their schools, the community, and the nation of which they are a part.

# BOOK REVIEWS

**DEPARTMENT OF AUDIO-VISUAL INSTRUCTION.** *Planning Schools for Use of Audio-Visual Materials, Nos. 1, 2, 3, 4.* Washington, D. C.: the Department.

**Reviewed by**

**• NEVILLE PEARSON**

The DAVI quartet—Nos. 1, 2, 3, 4, designed to provide needed harmony in school plant planning, was the direct result of a lack of standards for the facilities needed for good AV utilization in the many new schools being built throughout the nation. Architects and many school administrators did not understand that these new "power tools for teachers" required special facilities for good use. The resulting buildings were disappointing. School building after school building went up with little or no consideration given the needs of audio-visual materials in the classroom.

DAVI's Committee on Buildings and Equipment undertook this major project, and in a short time the combined experiences and thinking of the group had been written, edited, and published.

Directed toward the architects concerned with planning schools, the school administrator who is involved in a building program, and the audio-visual director-coordinator who wishes a quick, handy reference as he builds his program, the four books fill a distinct need in the field of audio-visual publications. In Book No. 1 the editors state: "Audio-visual ways of teaching and learning are here to stay. Hence it is an expensive oversight to neglect this fact in the planning of new school plants. Negligence in providing for audio-visual facilities is a sign of basic defect in a community's school building program."

Neville Pearson is associate professor of education, University of Minnesota, Minneapolis, Minnesota.

Dr. Irene F. Cypher and Dr. A. J. Foy Cross have served as co-chairmen for the four books. They have been assisted by some 29 members of the Committee and more than 75 consultants.

*NO. 1, CLASSROOMS*—The first in the series, this book was published in July 1952, revised in June 1953, and at the present time a complete revision is nearly ready and is scheduled for publication early in 1958. The third edition will be about the same size as the second—40 pages, well illustrated, with a bibliography and list of companies producing and distributing light control materials and equipment.

All of the books follow the same general format—the Why, the What, and the How of each particular problem. *No. 1* quickly establishes the need for planning the self-contained classroom which will be adequate for all of the activities that should take place in the classroom. Flexible space must be provided for the class, a work-office area for the teacher, special activity space for the students, and space for storage. Standards for space, lighting and light control, heating and ventilation, electrical needs, acoustics and built-in features such as tackboard, chalkboard, and display space are suggested.

School buildings built today will be in use for the next 50 or 60 years. The editors, looking to the future, state that "planning to construct a building to fit only present-day curriculums and class schedules is poor planning." No present-day curriculum demands or class schedules should be permitted to determine through room size or arrangement the curriculum or schedule of the future. All walls should be as much as possible "instructional" walls equipped and lighted for instructional purposes. Minimum fenestration, possibly a 40-inch vision strip on one wall, together with thoroughly adequate electrical lighting, make for more efficient use of the room space. Serious consideration must be given to making all new school buildings readily adaptable to air conditioning equipment. No new building should be constructed without ample wiring for classroom television equipment. Through proper planning, it should be possible to provide the potential of both open and closed circuit television to any and all rooms.

Edition three of *No. 1, Classrooms,* rates high as MUST reading for all persons interested in better schools.

*NO. 2, AUDITORIUMS*—February 1953, 36 pages. Illustrated bibliography and brief list of companies manufacturing audio-visual equipment for auditorium use.

Following the same pattern as in *No. 1*—Why, What, and How—*Auditoriums* treats matters which are frequently overlooked or haphazardly included in planning auditoriums to meet today's requirements and tomorrow's needs. The booklet does not attempt to cover specific performance standards for such combination rooms as auditorium-gymnasiums. However, many of the standards listed apply equally well to these dual-purpose rooms as to regular auditoriums. Neither does the booklet go into details of stage facilities. Seating, adequate activity space, acoustics, ventilation, wiring, light control, and equipment are covered in a concise manner. Some of the wiring standards, particularly, are often neglected by the person unfamiliar with special audio and visual needs. Suggestions for the projection booth are included.

*No. 2* also is a "must reading" for architects, but it probably makes less of a contribution to school planning generally than *No. 1* and *No. 3*.

*NO. 3, AV INSTRUCTIONAL MATERIALS CENTER*—January 1954, 80 pages, illustrated; bibliography of publications, motion pictures, filmstrips, and slide sets; and brief list of companies manufacturing and/or distributing audio-visual equipment for use in materials centers.

*No. 3* steps into a newer field, giving a precise definition as to what constitutes an Instructional Materials Center and what a center is not. The fact that service of the IM center depends on the leadership demonstrated by the AV director is forcefully presented. The general organization patterns for the IM center are broad enough to cover any school from the small to the large—and the illustrations of floor plans, storage and production facilities, and then suggestions for handling and distributing materials are most inclusive, simple to complete. Space needs, tips on handling of materials and equipment with suggestions for servicing are included. The illustrations of materials storage cabinets and containers, commercial and improvised, should be most helpful to anyone looking for ideas. Storage, handling, care, and distribution of equipment are also covered thoroughly. Production facilities, up to and including TV, are covered. With the increase of educational TV, these suggestions should prove most valuable.

*No. 3* states, as part of the conclusion, the IM "Center should be conceived as an integral part of over-all curriculum planning. It must not be thought of as a 'program' in itself." Certainly *No. 3* rates reading by all curriculum people, all AV people, and school

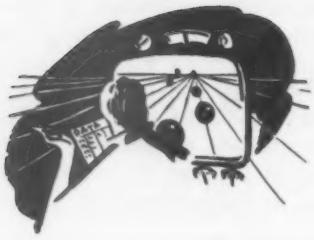
administrators and architects as well. As a postscript, the check list compiled by William H. Durr and originally published in the *Journal* of the National Education Association, "What Is Your School's I.M. Quotient?" is included. This provocative "quiz" enables any teacher to rate his school. The following ideas presented in *No. 3* will give a high *plus* score.

*NO. 4, AV CENTERS IN COLLEGES AND UNIVERSITIES*—September 1955, 140 pages, illustrated; case study of audio-visual centers; bibliography consisting of nine sections; suggested production equipment for audio, still, and motion picture production; and a reference directory of manufacturers and distributors.

Like *No. 3*, *No. 4* is in a newer field for colleges and universities. The general pattern of the previous books is followed—the need established, the goals defined, and ways of achieving these goals suggested. The needs of colleges and universities for such special departments as reading clinics, speech and hearing clinics, modern language laboratories, and teaching materials laboratories are well covered. The case studies of AV centers in six schools will be most valuable to colleges which are now making plans to centralize their instructional materials.

The editors of *No. 4* point out that no one plan for an AV center will meet the needs of all colleges—but much time, money, and effort can be saved by looking and planning ahead and by profiting from the experiences of others. They further point out that in planning ahead, the plans should be large enough to take care of the expected growth and rapidly increased demands on the centers. Past experience shows that most campuses tend to underestimate their eventual space needs.

*No. 4*, along with the other members of the quartet, deserves reading by all interested in the audio-visual field and particularly those interested in higher education. For them it is a package of ideas to be opened, examined, and then adapted to meet their special needs.



# RESEARCH ABSTRACTS

## FILM

**ISCOE, IRA; MIMS, JEAN; and WHITE, PAUL.** "An Exploration in the Use of Personal Adjustment Motion Pictures as a Psychotherapeutic Medium." *Journal of Clinical Psychology* 12:358-361; October 1956.

*Purpose:* To explore the therapeutic possibilities of some selected personal adjustment films in what might be described as a group therapy situation.

*Procedure:* The subjects were nine adolescent boys at a residential school for disturbed children. They had a common background of truancy, broken homes, and inability to make friends. Their I.Q.'s ranged from 85 to 140. Twelve films were shown illustrating poor human adjustment and the depth of human emotionality. Some of the films were *Age of Turmoil, Fears of Children, Angry Boy,* and *Over-Dependency.* All the subjects attended the meetings voluntarily.

After each film had been seen, a "bull session" was held with no definite time for adjournment.

*Results:* The films served to stimulate conversation in areas which the subjects previously resisted. Participation increased from session to session. The emotional impact of the films was very strong. The subjects tended to see in the films situations very close to their own, sometimes even making exclamations during the actual film showing itself. At times the reactions to the films were tears or anger. The boys' discussion departed more and more from the content of the films and expanded into their own personal problems. There was evidence that the boys remembered incidents in the films for months.

The authors conclude that personal adjustment motion pictures offer promising means of getting at the underlying maladjustments of emotionally disturbed children. They did feel that some of the solutions in the films were too "pat," that the dialogue in the films was often too sophisticated and not common to adolescents, and that a more careful selection of the films was desirable, with the more emotionally charged films coming toward the end of the series. They feel, however, that motion pictures are an important psychotherapeutic tool.—*Paul R. Wendt*

**ROMANO, LOUIS.** *The Role of Sixteen Millimeter Motion Pictures and Projected Still Pictures in Science Unit Vocabulary Learnings at Grades Five, Six, and Seven.* Doctor's thesis. Madison: University of Wisconsin, 1955. 112 p. (Typewritten)

*Purpose:* To identify the role of 16mm motion pictures and projected still pictures in science unit vocabulary learnings in the fifth, sixth, and seventh grades.

*Procedure:* Children from two fifth-, two sixth-, and two seventh-grade groups in the public schools of Shorewood and Whitefish Bay, Wisconsin, participated in the study with each group rotated so as to serve in turn as an experimental and a control group. In both control and experimental groups, blackboards, bulletin boards, charts, models, flat pictures, and field trips were used, but motion pictures and projected still pictures (filmstrips, 2 x 2 and 3¼ x 4 slides, and pictures used with the opaque projector) were used only in the experimental situations and served as the experimental factors.

Fifty-item vocabulary tests based upon reviewed science textbooks from the third-grade level through the ninth-grade level were developed for each of the six science units studied. Vocabulary tests for each unit of study were administered to both experimental and control groups at the beginning of the year prior to teaching the science units. Five weeks following the initiation of the unit of study, a vocabulary test for that particular unit was given both the experimental and control groups to determine the extent of vocabulary gain. A retention test consisting of these same vocabulary tests was administered to all participants six months after the conclusion of each unit in order to determine the amount of vocabulary retained over that period of time.

Further data were gathered by obtaining the reactions of teachers and pupils to the utilization of audio-visual materials in the classroom.

*Conclusions:*

1. All experimental groups using the motion picture films and projected still pictures evidenced large increases in vocabulary gained over the control groups in all units of study.
2. Retest scores of the experimental group in the Rocks and Astronomy units of study were lower than the final test scores, while in all the other units of study for the experimental group and for all the units of the control groups, the retest scores were higher than the final test scores. There was a loss in retention for the experimental group in only two of the units of study.
3. No definite relationship seems to exist as to IQ scores and gains achieved in the vocabulary tests in any of the units of study on the fifth, sixth, and seventh grades.
4. In only two units of study (Rocks and Air) was there a high positive correlation existing between standardized reading vocabulary scores and the

vocabulary test scores in this study. In the remaining four units, there was only a slight relationship.

5. All of the teachers in this study pointed out the intrinsic value of the use of audio-visual materials in creating more effective teaching-learning situations.

6. The boys and girls participating in this study pointed out that an instructional program which uses many audio-visual materials enhances the learning situation.—*John Moldstad*

**HIRSCH, RICHARD S.** *Experiments in Rifle Marksmanship Training—Film Experiment.* Human Engineering Report SDC 494-01-2, Special Devices Center, Port Washington, L. I., New York. June 15, 1953. 10 p.

*Purpose:* The purpose was to determine whether short training films of selected aspects of marksmanship training could be utilized in place of the present lecture and demonstration method of instruction. It was also desired to discover whether films could be shown to trainees on or near the training area.

*Procedure:* A series of eight films, each running less than eight minutes, was prepared on (a) sighting and aiming, (b) prone position, (c) kneeling position, (d) hasty sling, (e) loop sling, and (f) trigger squeeze. Each film was formed in a loop for continuously repeating projection. Films were produced by the Instructional Film Research Program so as to incorporate as many as possible of the relevant film research findings. Six cabinet projectors were installed in six tents adjoining the firing range. For the experiment, 220 men were divided into experimental and control groups. The experimental group saw the films as often as required instead of receiving formal lectures or demonstrations. The control group was taught by the best available instructors. The group scoring highest received a three-day pass.

*Results:* Instruction with films was better than the regular instruction but not significantly better. The films may have been better than the regular instructors would have been. The experiment demonstrated that films can be made available for instruction on or near the firing range.—*L. Twyford*

**STAUDOHAR, FRANK T.,** and **SMITH, ROBERT G., JR.** "The Contribution of Lecture Supplements to the Effectiveness of an Attitudinal Film." *Journal of Applied Psychology* 40:109-111; 1956. (Distributed separately by the Air Research and Development Command, Lackland Air Force Base, San Antonio, Texas, as AFPTRC-TN-56-82, June 1956, *Research Report*, same title.)

*Purposes:* The study attempts to evaluate the use of lectures in supplementing the effective use of a Hollywood film, *Twelve O'Clock High*, in accomplishing specific training objectives in connection with developing favorable attitudes toward discipline.

*Procedure:* Having selected the film as having possibilities for developing attitudes toward the military, the investigators proceeded to organize lecture materials to focus specifically on problems of military discipline. Lectures of approximately eight minutes' length were developed to underscore the aspects and incidents of the film which related to military discipline. The

word level of the lectures was evaluated as "fairly easy" by the Flesch Reading Ease Score.

Over 850 basic trainee airmen were subjects of the procedure. They were divided into four experimental groups: (a) lecture prior to film; (b) lecture after film; (c) lecture before and after film; (d) no lecture. All groups were randomly assigned from four flights.

A 16-item attitude scale dealing with discipline was developed with a subject sample of 311 trainees. This scale was administered to all groups. The scale was completed after the film and lecture in all cases.

The data were analyzed with analysis of variance techniques and "t" tests.

*Results:* Every one of the lecture groups made significant increases in favorableness toward military discipline attitudes. Evidence did not indicate that the lecture procedures varied in effectiveness, however.

*Discussion:* Two limitations were recognized by the investigators. First, efforts were made, in all cases, to have the lecture delivered by an officer who had a high degree of prestige by virtue of experience and the battle ribbons worn during the lecture. Second, the subjects were men who had limited experience with the Air Force. It was noted that increased experience might appreciably change the attitudes noted in this study.—*Albert L. Goldberg*

**SCOLLON, ROBERT W., JR.** ***The Relative Effectiveness of Several Film Variables in Modifying Attitudes: A Study of the Application of Films for Influencing the Acceptability of Foods.*** Technical Report 269–7–60. Research by the Instructional Film Research Program, Pennsylvania State University for the U. S. Naval Training Device Center, Office of Naval Research, Port Washington, L. I., New York. June 9, 1956. 53 p.

*Purpose:* The purpose of this research was to discover how films might be used to change attitudes. The basic field ration—C ration—was selected as the particular food item for attitude change. In this study several film variables were investigated which were thought to be related to the effectiveness of films in restructuring attitudes. These variables concerned the prestige of the main character in the film, the degree to which the main character is identified and characterized in the film, and the relationship of the main character to the trainee.

*Procedure:* Five versions of a 15-minute film were produced. These were a (a) basic film with anonymous narrator, (b) basic film with scientist narrator, (c) basic film with veteran narrator, (d) basic film with anonymous narrator and added scientist interview sequences, and (e) basic film with anonymous narrator and added veteran interview sequences. Five measures of attitudes were employed for testing Army trainees.

*Results:* It was concluded that, although the introduction of a communicator of prestige seems to lend effectiveness to a film, to accomplish appreciable gain over anonymous narration, something more must be added. The results do not bear out the hypothesis that a film with a communicator of a high level of characterization would be more effective than a film with a communicator of a low level of characterization. It was concluded that the degree of relationship of the communicator to audience reference group is an important determinant in the effectiveness of attitude modification films and probably more important than the level of characterization of the communicator.—*L. Twyford*

**NORTHROP, DEAN S.** *Effects on Learning of the Prominence of Organizational Outlines in Instructional Films.* Human Engineering Report SDC 269–7–33. Research by the Instructional Film Research Program, Pennsylvania State University for the U. S. Naval Training Device Center, Port Washington, L. I., New York. October 1952. 24 p.

*Purpose:* The purpose of this study was to investigate the effects on learning when organizational titles and commentary are added at appropriate points in instructional films. This included (a) a study of the prominence of the organizational outline, (b) effects of organizational outline on learning from films with different types of treatment, and (c) the relationship between prominence of organizational outlining and the learning ability of audience members of high and low intelligence.

*Procedure:* Three informational films were selected to represent a "discrete item," a "logical development," and a "chronological" type of film. Each film was modified by insertion of titles indicating the main points of the film. A second modification of each film involved the use of subheadings. Versions of the film were shown to 1947 Naval recruits, who were tested in multiple-choice tests.

*Results:* The addition of titles and commentary material will increase learning if the film is not inherently well organized. Addition of titles to a dramatic or narrative type of film did not seem to increase learning. The less intelligent members of the audience may be expected to profit more from the addition of outline material. A detailed outline was no more effective than one that stressed the salient points in the film.—*L. Twyford*

**WITTY, PAUL, and FITZWATER, JAMES P.** "An Experiment with Films, Film-Readers, and the Magnetic Sound Track Projector." *Elementary English* 30:232-241; April 1953.

*Purpose:* To explore the relationship of film experience to the acquisition of skill in silent reading.

*Procedure:* Second-grade children in six Chicago schools took part in the experimental study during the second half of the school year 1951-52. The average number of participating pupils in each school was 27, with a range in number from 10 to 41. During the first half of the semester, the children were instructed according to the regular program in which basal readers and supplementary materials were employed; during the second half of the semester, they saw and heard four films, read the associated film-readers, and used a special magnetic sound track recording projector to record certain aspects of their language development. Throughout the entire semester, care was taken to plan lessons carefully so as to include word study, discussion, and related reading.

All pupils were given the primary level of the *California Reading Test* at the beginning, at the midpoint, and at the end of the semester. A different form was used each time. Interest inventories were administered at the beginning and at the end of the semester, and questionnaires pertaining to their pupils' development were filled in by the teachers. The *Kuhlman-Anderson Test of Mental Ability* and the *Northwestern University Interest Inventory (revised)* were also administered to each pupil. Comparisons of

progress in reading made during the first and second half of the semester were made in an effort to determine to some extent the relative effectiveness of the two approaches in promoting development in reading.

*Results:* (a) It was found that the primary level of the *California Reading Test* was too easy for many of the second-graders and so it was decided, for evaluation purposes, to eliminate consideration of any section or any subtest when half or more of the pupils in any class made perfect scores on taking the second form of the test. Comparisons were made on the remaining items in which growth might be revealed during the experimental period. (b) When allowance was made for pupils making perfect scores at the midpoint of the experiment, it was found that a somewhat greater gain in reading skill was made during the experimental period than during the control period. (c) The majority of the nine teachers agreed that (1) their children's rate of reading was faster; (2) students did more related reading; (3) class discussion was greatly improved; and (4) generally there was greater interest, gains in speech and oral expression, and more independent reading. (d) Over 95 percent of the children thought the movies had helped in reading and vocabulary development, and wanted more work of this kind. (e) Thirty percent of the pupils indicated they had initiated hobbies and collections as a result of the film and film-reader experience. (f) About 70 percent stressed the fact that through these activities, particularly the making of the recording, they had learned to work more happily and effectively with their peers.

—*John Moldstad*

**VANDERMEER, A. W., and COGSWELL, JOHN.** *Instructional Effect of the Film "How To Operate the Army 16mm Sound Projector Set."* Technical Report SDC 269-7-29. Research by the Instructional Film Research Program, Pennsylvania State University for the Special Devices Center, Office of Naval Research, Port Washington, L. I., New York. (Copies may be purchased from the Department of Commerce, Office of Technical Services, Washington, D. C., PB No. 111142. 25¢.) September 1952 26 p.

*Problem:* The purpose of this investigation was to study a film which teaches the skill of operating and maintaining the Army Sound Motion Picture Projector. It was desired to know how well the film taught the necessary skills and whether attitudes were modified by it.

*Procedure:* Four classes of trainees regularly assigned to a Projectionist School participated in the experiment. The trainees were told the purpose of the experiment, given a personal data questionnaire and an opinion form prior to seeing the film. After the film showing they were given a performance test, asked to fill another opinion survey form, and study a checklist of projector operation.

*Results:* The film gave training scores ranging from 62 to 92 percent; this was an increase of 37 to 62 percent over pre-film scores. More learning occurred when the men were prepared for the film showing by being told exactly what they were to learn. Showing the film twice produced greater learning than showing it once. This research indicated that complex skills can be taught by films alone. Trainees were led to accept the attitudes toward the projectionist's job that were favored by the film.—*L. Twyford*

## TELEVISION

**HERMINGHAUS, EARL G.** *An Investigation of Television Teaching.* Conducted by the St. Louis Educational Television Commission and the St. Louis Public Schools under a grant from The Fund for the Advancement of Education. St. Louis Public Schools, St. Louis, Missouri. September 1956. 54 p.

*Purpose:* To discover whether it is possible for a competent television teacher to teach large groups of children effectively without supplementary instruction. What would be the reaction of pupils and teachers to large-group direct television teaching?

*Procedure:* Television instruction was offered in ninth-grade general science, ninth-grade English composition, and second-grade spelling. The instruction was given daily for about one-half hour for each subject over a community-operated educational station. Twenty-four-inch television sets were placed in five schools. Supervising teachers provided "feedback" reports to aid in preparation of the next lesson. Three teachers devoted full time to preparation and presentation of the lessons. Seven teacher assistants aided seven supervising classroom teachers in the performance of routine tasks. One television producer was assigned full time to the project and other station personnel were employed part time. About 1000 students took one of the televised courses. Tests were given before and after the television course.

*Results:* It was found that students in large-group television classes in ninth-grade English composition and general science showed a degree of achievement at least equal to that of control classes. Teachers saw both advantages and disadvantages in television teaching. Students, on the whole, did not react favorably to the program under the viewing conditions that prevailed.—*L. Twyford*

**POLLOCK, THOMAS CLARK, and OTHERS.** *Closed Circuit Television as a Medium of Instruction, 1955-1956.* Project sponsored by The Fund for the Advancement of Education. New York University, New York City. October 1956. 56 p.

*Purpose:* The purpose of this research was to discover the potentialities of closed circuit television for teaching College Composition and a course on Literature of England. More specifically, it was desired to learn whether closed circuit television would maintain, lower, or improve the quality of instruction in particular classes; whether the use of a well-equipped television studio had any noticeable advantages over the use of television cameras set up in a regular classroom; and what the relation is between the cost of instruction by the use of closed circuit television and the quality of instruction.

*Procedure:* A television studio was constructed and equipped with image orthicon cameras, a film chain, and related equipment. Eight classrooms were equipped with two receivers each with 24-inch screen. No arrangements were made for two-way radio communication between classrooms and studio. Graduate assistants or instructors served as proctors. Four hundred and seventy-three students took College Composition and 176 took Literature of England

by television. Courses were televised for three hours per week. The total cost for construction and operation was $125,481. The groups spent two hours a week viewing television and one hour in a "tutorial group" where papers and examinations were discussed.

*Results:* It was concluded that college teachers are quite unprepared to teach by television. Fewer than half of the faculty when questioned concerning the possibility of acquiring new information by television had a favorable opinion prior to the experiment. They felt there would not be enough personal contact with the instructor and that the television method would be less effective. After the experiment the instructors were divided as to whether the television had concentrated or watered down the course content. The teachers who served as tutors generally felt that television had detrimental effects. The advantages included "use of special talent of a particular teacher in a particular area," "development of general background information," "pictorial supplements in the literature course as interest-getters," and "textual analysis." The detrimental effect most often noted was lack of "personal interchange between student and instructor." About 19 hours of time were spent in preparation for one hour of television time. Disturbing aspects of the mechanics of television included the number of people in the studio, difficulty of getting make-up off the face and ears, loss of classroom situation, and lack of contact with the audience. Few teaching techniques were found to be unique to television. It was felt that historical and biographical material was best suited for television. They recommended that the course should be given by not more than two instructors rather than eight. The department head indicated that the course in English Literature was a success but that College Composition would require more work before it could be called successful.

The students felt that the television course was less effective than traditional methods. Judging from grades obtained, it was felt by the experimenters that learning by television was about equal to learning by more traditional methods. Data and photographs are given on the construction and costs of the television studio. Syllabi of the courses are included in the appendix.—*L. Twyford*

**AMBROSINO, MICHAEL J.; DUNSTAN, WILLIAM H.; and HAAKE, BERNARD F.** *The Schenectady Experiment.* A Report of the Closed Circuit Television Project conducted by the Schenectady Public Schools and The Fund for Advancement of Education. Schenectady Public Schools, Schenectady, N. Y. 1956. 61 p.

*Purpose:* To demonstrate that it is economically practical for future school construction to include closed circuit television facilities and to show that the effectiveness of expert teachers, supplemented by teacher aids, could be expanded. The course areas to be televised were Mathematics, English, Chemistry and French.

*Procedure:* Mathematics 11 was taught to 30 students in a studio-classroom, and 30 additional students were taught in a remote classroom. Chemistry was offered to approximately 35 pupils. This instruction lasted six weeks. English 10 was taught to approximately 70 pupils on a four-week basis. Fifty students took conversational French. The equipment consisted of a Dage 101A camera with vari-focal zoom lens, four 21-inch receivers and associated equipment. One classroom was used as an originating classroom, and the signal

was sent to two other classrooms. RF transmission was abandoned in favor of video transmission. Several achievement and standardized tests were administered.

*Results:* It became clear that closed circuit television to be effective must be within the financial reach of school systems. The equipment must be of low cost, easy to operate, compact, have low maintenance and have good quality. The report describes problems in location of equipment, sound quality, light requirements, visual presentation requirements, and teaching techniques. Students operated the equipment. Learning by the television groups and control groups was about the same. It was concluded that closed circuit television is feasible at the secondary educational level and that the effectiveness of a single teacher can be extended to at least three or four classes. The importance of visual aids became apparent to television teachers. Information on television instructional methods are required for the general introduction of television training.—*L. Twyford*

**MACOMBER, F. G.; SIEGEL, LAURENCE; HATHAWAY, S. C.; and DOME, J. E.** ***Miami University Experimental Study in Instructional Procedures.*** Under grant from The Fund for the Advancement of Education. Miami University, Oxford, Ohio. Octobe 1, 1956. 48 p.

*Purpose*: Large- versus small-group instruction was the major problem of this study. This included an effort to realize the advantages of small-group instruction in large-group teaching by the medium of television. The shortage of well-qualified college teachers requires large groups to be taught at one time to utilize effectively existing talent. Courses in Foundations of Human Behavior, Principles of Human Physiology, Introductory Sociology, and Human Biology were courses selected for the research.

*Procedure:* A television studio was built and equipped at a cost of $34,000. Five classrooms were each equipped with two 21-inch receivers. Five hundred and twenty-three students were taught by television in the four courses during one semester. Other courses were taught in large groups without the use of television, and two courses were taught by graduate assistants. Control groups were established for each course. Twelve problems were investigated in the general area of achievement and student attitudes. Experimental and control groups were matched on four tests. Achievement tests consisted of the semester examinations. Three Thurstone-type scales were used to measure attitudes.

*Results:* There were no differences in achievement of the television, large class or control groups. Achievement was independent of student attitudes. Student ratings of the instructor were less favorable in the large classes but were the same or perhaps better in the television sections. Students indicated that they would enroll in a regular course rather than a television course or large class next semester. They would prefer a good instructor in any event. Students in all large classes were unfavorable to large-class instruction. Students missed the student-instructor contact in all television and large-class sessions. The major problems in large-group instruction are the lack of large rooms to seat 90 students, lack of good graduate assistants, preparation for large-group instruction, and the cost of televised instruction.—*L. Twyford*

**THOMAS, KEN.** *Television Research and the Study of Man.* U. S. Naval Training Device Center, Port Washington, L. I., New York. October 1956. 39p.

*Purpose:* To investigate the use of television at the National Institute of Health for improving the volume and accuracy of communication. It was desired to apply television to the following situation: use of scientific tools, abnormal human behavior, normal human behavior in the home environment, animal behavior, teacher self-instruction, familiarization, orientation, and interprofessional communication.

*Procedure:* Twenty-two specialists from the staff of the Training Device Center worked with 350 members of the Institute's staff. Using standard image orthicon and vidicon cameras and kinescope recorders, twenty-six application experiments were carried out. These included the ultracentrifuge, ordinary microscope, phase microscope, ultraviolet microscope, Zeiss slit lamp, fundus camera, X-ray equipment, doctor and patient interview, sleep habits, child school activity, child play activity, child psychiatric treatment, normal mother infant relations, unsupervised children at play, teen-ager preparing family dinner, family dinner, teen-age party in rumpus room, behavior of cats, teacher self-instruction, teacher evaluation, library familiarization, organization orientation, research program orientation, staff conference with and without an audience, and color microscopy. Data on the effectiveness of the methods were collected by kinescope recordings, motion picture recordings, and note taking. These were made available in a film report.

*Results:* It was evident to the experimenter and participants that television's ability to increase image size, amplify light, and increase contrast make the equipment useful in such a research environment. Film recording was found to be useful. Color was felt to be valuable in specific instances. Equipment was felt to be too clumsy. Flexible, low-cost television is recommended.—*L. Twyford*

## PERCEPTION

**RYAN, T. A. and SCHWARTZ, C. B.** "The Speed of Perception of the Function of Mode of Representation: The Relative Effectiveness of Four Modes of Representation of Dimensional Objects." *American Journal of Psychology* 69:60-69; March 1956.

*Purpose:* To determine the relative effectiveness of four modes of representation of 3-dimensional objects, the four modes being a photograph, a shaded drawing, a line drawing, and a cartoon. The criterion of effectiveness was the speed of recognition of details in the picture. By "cartoon" the authors mean a hand-drawn, simplified sketch emphasizing important aspects.

*Procedure:* Four photographs were made of a human hand, each in a different orientation. Four photographs were made of five electrical knife switches. In each photograph a different switch was closed. Four photographs were made of a cutaway model of the valves of a steam engine at four different stages of the cycle. From the twelve photographs twelve line drawings were made by tracing. Twelve shaded drawings were made the same way. Twelve

cartoons were drawn with the same outlines but varying the rest of the figure. The 48 illustrations were reduced to photographic 2 x 2 inch slides and projected tachistoscopically. The presentation times were given in a single ascending series which continued until S gave the correct response. Each series began with 0.02 of a second, repeated with steps of 0.01 of a second up to 0.10 of a second; and then steps of 0.10 of a second to one second. Each series utilized the 16 illustrations of one object—four positions of that object and four modes of illustrating each of these positions. The 16 slides were presented in a different random order for each subject, with the random orders selected in such a way that each slide appeared once in each position for the series for one of the subjects. After each presentation of each slide the subject was asked to reproduce the position he had seen. For the hands, he was to place his own hand in the position he saw. For the switches, he attempted to name the particular switch which was open and for the steam valves, to state which stage of the cycle was shown. At the beginning of the presentations of the slides, each subject was told what the objects were and shown the cutaway model of the steam engine.

*Results:* The average thresholds for 16 subjects for each of the illustrations and for all the objects taken together showed that details in the cartoon were identified most easily, and the line drawing was the worst; the photograph and shaded drawing were about equal. The rank orders were significantly different. The authors conclude that this pilot study justifies extending this type of experimentation to complex objects in which the crucial relationships are three dimensional.—*Paul R. Wendt*

## IDENTIFICATION WITH PHOTOGRAPHS

**BEVAN, WILLIAM; SECORD, PAUL F.; and RICHARDS, JAMES M.** "Personalities in Faces: V. Personal Identification and the Judgment of Facial Characteristics." *Journal of Social Psychology* 44:289-291; November 1956.

*Purpose:* To determine if a subject's degree of identification with an individual shown in a portrait photograph will influence his estimates of physiognomic features. In other words, will a subject tend to describe people he likes and identifies with as looking like himself?

*Procedure:* Experimental subjects were 15 male college students comprising the membership of a fraternity. Full-face photographs, including only the face and neck against a uniform white background, were taken. These were projected on a screen and each subject was asked to rate all 15 photographs, including his own, on 29 facial characteristics on a seven-point scale. Examples are: light-dark complexion, small-large nose, and so forth. The control group of 15 students at another university made similar ratings of the 15 photographs of the fraternity members, none of whom they knew. Finally, the experimental subjects were asked to identify the person in their group they would most like to be and least like to be. Product-moment correlation coefficients were next obtained between each subject's rating of his own physiognomy and those of the persons he had indicated he would most and least like to be, and these correlations were compared with a correlation between modal ratings made by the control group of the same pairs of pictures.

*Results:* When individual $r$'s were transformed into $z$ scores and a $t$ test performed, the experimental control difference was found not to be significant. This was true both in the case of correlations with persons that the subjects would most like to be and least like to be. The conclusion is that the subjects liking or disliking each other had no significant effect on their perceptions of elements of the features as shown in the photographs.

The authors conclude that further experimentation is necessary before any conclusions may be drawn, but they call attention to the fact that a number of subjects' differences were marked, and this might provide a clue for further experimentation. They suggest that the procedure of specifying 29 detailed variables of physiognomy would make difficult the distortion of perception by the personality of the viewer.—*Paul R. Wendt*

**CHAMBERS, J. L.** "Identification with Photographs of People." *Journal of Consulting Psychology* 21:232-234; June 1957.

*Purpose:* To test the hypothesis that when shown photographs of strangers, subjects tend to like the individuals whom they think have the same traits that they do and dislike the individuals whom they think have the opposite traits from theirs.

*Procedure:* Fifteen men and 18 women in a small liberal arts college were the subjects. Each man was shown 15 cards containing four photographs of men. Each woman was shown 15 cards containing four photographs of women. The cards were 6 x 8 inches and contained four head and shoulder portraits of people unfamiliar to the subjects.

The trait selected for identification was self-assertiveness. Each subject was asked to select from each card of four photographs the person who looked most self-assertive and the person who looked least self-assertive. Each subject went through the same cards again and selected from each group of four the person they liked best and the one they liked least. Next each subject was asked to rate each of the other subjects on a six-point rating scale for the trait of self-assertiveness employing the Q-sort technique. Finally, scores were obtained for all subjects on the Guilford-Martin Ascendency and Lack of Inferiority Scales of the GAMIN test.

*Result:* Correlations between the picture identification test and the trait measures of lack of inferiority, ascendency, and self-assertiveness were significant at the .01 level, .05 level, and the .10 level, respectively. None of the correlations were high, but all were in a direction to support the hypothesis of positive identification with photographs of people who seem to them to have the same amount of this trait. The subjects who tended to have a positive relationship between their preferences for photographs and their ratings of the same photographs along a self-assertive personality dimension, tended to score high on measures of ascendency, lack of inferiority, and self-assertiveness. A negative relationship between the picture ratings and preferences was obtained for subjects scoring low on the traits of ascendency, lack of inferiority, and self-assertiveness.

The author concludes that "the results indicate that a picture identification technique may be profitably applied to personality measurement when the subject is permitted to determine the stimulus value of a photograph."—*Paul R. Wendt*

## INSTRUCTIONAL METHODS AND TRAINING AIDS

**NEWMAN, SLATER E., and HIGHLAND, RICHARD W.** *The Effectiveness of Four Instructional Methods at Different Stages of a Course.* Research Report AFPTRC–TN–56–68, Air Force Personnel and Training Research Center, Lackland Air Force Base, San Antonio, Texas. June 1956. 22 p.

*Purpose:* The purpose of this study was to evaluate the effectiveness of several of the mass communication media for replacing some function of the instructor. The methods studied were (a) recorder-workbook method in which the course material was presented by tape recordings and an accompanying workbook, (b) supervised reading method in which the course material was presented by chapters within a notebook, and (c) recorder-slide method in which the course material was presented by tape recordings and accompanying slides.

*Procedure:* Classes were taught a five-day course in Principles of Radio by regular instructors and by three alternative procedures in which the information-giving role of the instructor was eliminated and the course content was presented by the mass media. An examination covering the material taught was administered to all four groups at the end of the five-day course.

*Results:* The postcourse examination performance of the three mass media groups did not differ appreciably from that of the instructor group. The mass media methods were as effective for two-thirds of the course and less effective for the final third of the course. It was concluded that these mass media methods definitely deserve further study and development. There was some indication that mass media methods may vary in effectiveness with course lengths.—*L. Twyford*

**MURNIN, J. A., and VANDERMEER, A. W.** *A Methodological Study in the Development of a Training Aids Selection Form.* Technical Report 269–7–104. Research by the Instructional Film Research Program, Pennsylvania State University for the U. S. Naval Training Device Center, Office of Naval Research. Port Washington, L. I., New York. June 1, 1956. 42 p.

*Purpose:* The purpose of this study was to develop a checklist for the selection of the best training device for a particular training situation. The checklist was to incorporate findings from a series of experiments concerning the relative training effectiveness of mockups, charts, models, and cutaways.

*Procedure:* The criterion checklist submitted as part of the report was based on evidence and experience gained from four studies. Its development consisted largely of trial-and-error attempts to arrive at a satisfactory format. Form No. 1 was developed first and later revised to simplify its administration. This revised form was administered to five instructors. Criterion statements were modified as indicated by the instructor's recommendations. This process was repeated several times and rating procedures were established.

*Results:* A Training Task Analysis Form was developed that could be scored using six keys to determine whether the device should be two- or three-

dimensional and whether the device should be a model, mockup, chart, or cutaway. It was recommended that a validity study be conducted to discover the adequacy of the proposed form.—*L. Twyford*

**SWANSON, ROBERT A., and AUKES, LEWIS E.** *Evaluation of Training Devices for B–47 Fuel, Hydraulic and Rudder Power Control Systems.* Research Report AFPTRC–TN–56–2, Air Force Personnel and Training Research Center, Lackland Air Force Base, San Antonio, Texas. January 1956. 43 p.

*Purpose:* The purpose of this research was to discover whether there are any differences in the relative effectiveness of representative types of training devices when these devices are used as visual aids in lectures in the transitional maintenance training of skilled mechanics. This report provides a detailed analysis of research previously reported by R. A. Swanson in *Research Review* AFPTRC–TN–54–1.

*Procedure:* Approximately 1900 skilled technicians in the aircraft maintenance field were given instruction on one of three aircraft systems: fuel, hydraulic, and rudder control. In one procedure the men received a common lecture presentation. In the other procedure the participants studied one of the devices with no written or oral materials provided. The devices compared were the operating mockup, nonoperating mockup, cutaway mockup, animated panels, charts, and symbolic diagram. A criterion test was administered following the instruction periods. A retest was given six to eight weeks later.

*Results:* The scores indicated that within any one system in which common lecture was used with different devices the differences were not significant. When the lecture was omitted, significant differences were found in immediate recall scores for the hydraulic and rudder system but not for the fuel system. These differences were not obtained on delayed recall. Twenty-nine references were listed.—*L. Twyford*

**EDGERTON, H. A.; KOROBOW, N.; FEINBERG, M. R.; and O'MALLEY, T.** *A Study of the Utilization of Four Representative Training Devices.* Technical Report SDC 383-7-2. Research by Richardson, Bellows, Henry and Company for the Special Devices Center, Office of Naval Research, Port Washington, L. I., New York. April 14, 1952. 85 p.

*Purpose:* The purpose of this study was to analyze the utilization of four representative training aids in a military electronics school, and to recommend changes in their design and utilization procedures in order to increase their effectiveness.

*Procedure:* The four devices selected were an individual wiring board, an electro-dynamic kit, a Philco kit, and a universal bread board. To discover their attitudes and opinions toward the devices, 137 students and 42 instructors were interviewed. Thirty-eight classrooms and laboratories were observed and a checklist was filled out covering the behavior of the students and instructors and the characteristics of the classroom situation. Instructors filled out an evaluation form concerning the device.

*Results:* Specific recommendations are given for optimum utilization of each device and recommended structural changes. The electro-dynamic kit was felt to serve too much as entertainment rather than as a valuable adjunct to the lectures. The other devices were felt to be valuable but their effectiveness could be improved by redesign and by proper utilization. Eleven devices are pictured and described that were locally produced by the electronics school.
—*L. Twyford*

## GRAPHIC MATERIALS

**VERNON, M. D.** "The Visual Presentation of Factual Data." *British Journal of Educational Psychology*, Vol. XX, Part III. November 1950. 12 p.

*Purpose*: The extent to which grammar-school pupils aged 15-18 have difficulty in interpreting numerical data presented in graphical form and the contribution of written text accompanying the graphs were the problems investigated.

*Procedure:* In experiment A, three presentations of vital statistics were prepared in three forms: a pictorial chart, a graph, and a table of figures. Three groups of grammar-school pupils participated with each group seeing one graphical presentation of data in each of the three forms. After seeing the presentation for two minutes the boy or girl was asked three or four questions relating to the specific facts shown in it. General questions were asked at the end of a series. In experiment B, a written text was used which contained much the same information as that given in the charts.

*Results:* There was little difference in the results produced by using the pictorial chart, graph, and table of figures. The main factor involved in accuracy of remembering of particular presentations was the intrinsic clarity and comprehensibility of the content. This was particularly true in respect to the pupils' ability to draw general and logically related conclusions. None of the children showed great ability in giving a coherent statement of general conclusions. The same difficulties were encountered for graphical materials accompanied by written text. It was concluded that it is necessary to present a coherent and logical statement with the graphics, including statements to integrate the discrete facts.—*L. Twyford*

**VERNON, MAGDALEN D.** "The Value of Pictorial Illustration." *British Journal of Educational Psychology*, Vol. XXIII, Part III. November 1953. 8 p.

*Purpose:* Earlier research showed that the ability to understand and remember content of a written text was by no means always facilitated if the text was accompanied by graphs or charts. This research is an investigation of a similar problem: Do pictures help or hinder the acquisition of knowledge from the text? In addition, the researcher desired to learn whether pictures increase interest to any appreciable extent.

*Procedure:* Two series of experiments were carried out on boys and girls between 15 and 19 years of age. Two articles were used, one on tuberculosis and another on illness in young children. The first version was written in

popular style and was illustrated by four photographs. The second version was written more scientifically and was accompanied by graphs. Each child was given 10 minutes to read the article, after which he reported orally as questions were put to him. Twenty-four boys and girls participated in the second series of experiments to determine the amount remembered with and without pictorial illustration.

*Results:* Pictures sometimes helped the readers to remember the particular facts demonstrated by the pictures, but, on the whole, an illustrated version was remembered no better than an unillustrated version or one accompanied by graphs. Pictures produced a considerable emotional impact in a number of cases, but one could not conclude that these attitudes would lead to reasonable suggestions for courses of action. The students accepted the striking facts uncritically and ignored explanations about the causes of the problems.

—*L. Twyford*

**VERNON, M. D.** "The Use and Value of Graphical Material with a Written Text." *Occupational Psychology*, Vol. XXVI, No. 2. National Institute of Industrial Psychology, London. April 1952. 5 p.

*Purpose:* Do graphical illustrations assist in the clear presentation of specific facts which may or may not also be described in the text, and thus make them more impressive and better remembered? Do graphical presentations lead to an improved understanding of the general argument of the text? These were the problems investigated.

*Procedure:* English boys and girls at a level representative of the general public were shown five sets of pictorial charts illustrating a written text presented before, during, and after reading that text. In a second experiment the reading of an unillustrated text was compared with the reading of a text illustrated by graphs.

*Results:* A written argument was not found to be easier to understand and to remember when accompanied by the factual data in graphical form. It may be that sufficiently intelligent people are able to handle graphical material efficiently, but this ability was not found to occur widely except in those with a university education. Understanding may be greater when the text and charts or graphs are simple. Even then, the reader may not pay much attention to the graphics, nor does he necessarily understand the information. Graphics do not provide a short cut to understanding and remembering what would otherwise be beyond the comprehension of the reader.—*L. Twyford*

**SAUL, EZRA V., and OTHERS.** *A Review of the Literature Pertinent to the Design and Use of Effective Training Aids.* Technical Report SDC 494–08–1. Research by Tufts College for the Special Devices Center, Office of Naval Research, Port Washington, L. I., New York. February 24, 1956. 216 p.

*Purpose:* The objective of this report was to prepare annotated reviews of the literature for developing standards and criteria in the design, preparation, and utilization of effective graphic training aids.

*Procedure:* Approximately 1200 references in the areas of psychology, audio-visual education, advertising, visual art, and communication were

screened. Pertinent references were annotated and included in the report when they contained data, notions, or content pertinent to the problem of making visual training aids effective. The accepted annotations were categorized and each category was given a short introduction, summary, and evaluation. The categories which were developed and around which chapters were prepared include: vision; perception, aesthetics, and art; audio-visual education; advertising; engineering graphics; graphic training aids; instructor utilization. Each annotated study gives reference information, procedure used, and results.

*Results:* The report gives annotated entries for each category. Ninety-six annotated references are included in the chapter on vision and cover the subcategories of (a) characteristics of the symbol, (b) layout, (c) viewing distance and angle, (d) brightness of the display and surroundings, (e) contrast in the display and surroundings, and (f) use of color for display and surroundings. The findings in each subcategory are summarized. A total of 280 annotated references are included in the report.—*L. Twyford*

**VERNON, M. D.** "The Use and Value of Graphical Methods of Presenting Quantitative Data." *Occupational Psychology*, Vol. XXVI, No. 1. National Institute of Industrial Psychology, London. January 1952. 12 p.

*Purpose:* This research was conducted to discover whether graphs and charts of various kinds present data accurately and vividly and whether people who see them can understand and assimilate the information presented in the charts. This particular research study was concerned with graphical material presented alone with no more than brief descriptions or headings.

*Procedure:* One hundred and sixty airmen and 340 students were shown graphs, pictorial charts, maps, and photographs. After these were studied for a limited amount of time, the viewers were asked to report on their observations. Some interpretations were made with the graphic material in view and some with the material hidden.

*Results:* It was found that comparatively intelligent and well-educated people can learn from graphs and charts, particularly if these are fairly simple. Less educated individuals understood and remembered very little. This lack of understanding was greatest for complex data presentations. Pictorial charts were not found to be better than graphs. The less educated preferred the pictorial charts but probably did not understand them. Many people found it difficult to make interpretations from the graphic material. This implies that a verbal explanation must be supplied to give the graphical material a setting which will make its meaning clear.—*L. Twyford*

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*Purpose:* The purpose of this publication was to list research reports prepared by contractor and human engineering department personnel in support of the Center's program of training device research and development.

*Procedure:* Each report is listed by author, report title, date of issue, security classification, and report number. The report titles are organized under broad subjectmatter titles.

*Results:* Under the topic of learning, 24 reports on training methods and training analysis are listed. Sixty-nine reports on films and television are listed under mass training. Motor-skills reports are divided into a general category, positioning reactions, and transfer. Perception is broken into general vision, target detectability, color vision, and general audition. Voice communication reports include speech intelligibility, measurement, training, and devices. Five reports have been prepared on extreme environmental factors. The systems analysis section covers reports on subsurface, aircraft, and radar equipment. Twenty-eight reports are listed for controls and displays. Sixteen reports are listed for general training devices, 16 for gunnery devices, and 28 for flight training devices. Twenty-five reports are listed for research tools and human engineering in general. These research reports have been written during the past 10 years and generally are controlled experimental studies.—*L. Twyford*

THE RESEARCH Committee of the Department of Audio-Visual Instruction would like to communicate with those individuals who might present a paper at the annual meeting to be held this year at Minneapolis. These papers should be in written form and take from 20 to 30 minutes to present. These research papers might deal with any phase of the audio-visual field. Persons interested in presenting such a paper should communicate either with the chairman or the assistant chairman listed below.

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# AUDIO VISUAL COMMUNICATION REVIEW

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